SOAP and SANITARY CHEMICALS

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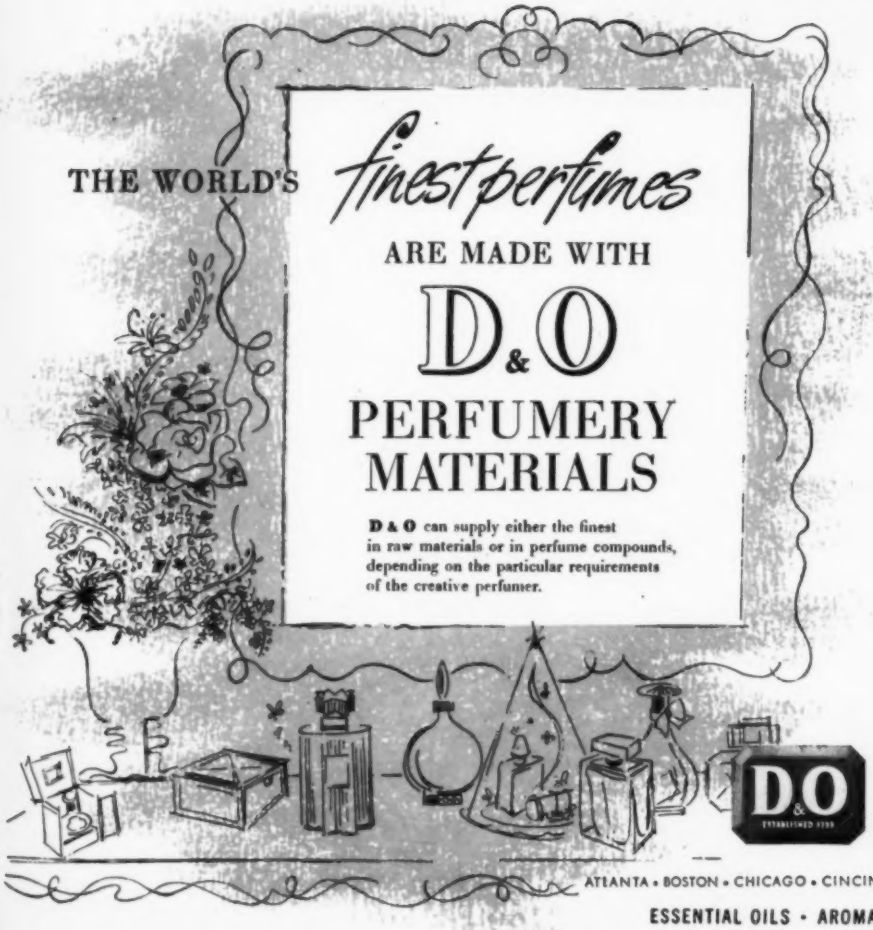
THE WORLD'S *finest perfumes* ARE MADE WITH

D&O

PERFUMERY MATERIALS

D & O can supply either the finest in raw materials or in perfume compounds, depending on the particular requirements of the creative perfumer.



☆ **ARCANA** A modern floral character with a Rose-Muguet note

☆ **CHENE 934** An Oriental in which a floral and a mossy note is blended

☆ **ORIENTAL 3750** The ideal dry and woody Oriental Perfume

☆ **PAQUITA** The modern and ever popular lively floral fragrance

D&O

DODGE & OLCOTT, INC.

180 Varick Street • New York 14, N. Y.

ATLANTA • BOSTON • CHICAGO • CINCINNATI • DALLAS • LOS ANGELES • PHILADELPHIA • ST. LOUIS • SAN FRANCISCO

ESSENTIAL OILS • AROMATIC CHEMICALS • PERFUME BASES • VANILLA • FLAVOR BASES

AUGUST 1950

COMPOUNDERS!

REPACKERS!

Is In a Class By Itself

- Mixes well with other ingredients
- Non-caking
- Free-flowing—ideal for filling machines
- Mild and non-irritating to the skin
- Softens water promptly and effectively
- Dissolves rapidly
- Perfectly stable
- Attractive package appearance
- Low in cost

Nothing can surpass the quality and performance that Solvay SNOWFLAKE CRYSTALS gives your product. All the features of a true sesquicarbonate of soda—in addition to the *exclusive* advantages listed here—are yours with these beautiful crystals. Whether used as an important ingredient in your compounds . . . or whether repacked "straight" . . . Solvay SNOWFLAKE CRYSTALS will help put your product in a class by itself.

FREE! If you are having difficulty compounding your formulae . . . or if you would like to change your formulae . . . Solvay Technical Service is ready to assist you. There is no cost or obligation—simply write to the nearest Solvay office.

*Reg. U. S. Pat. Off.

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Nytron • Ammonium Bicarbonate • Para-dichlorobenzene • Ortho-dichlorobenzene • Monochlorobenzene • Methanol • Ammonium Chloride • Formaldehyde

Your PRIVATE BRAND

Your private label and Brand Name add your prestige to the products you sell. When you offer Private Label Merchandise, your integrity endorses each item.
An easily identified label is as personal as a handshake and is significant to the buyer. Your label represents integrity and consistent quality . . . . you get that, and *more too,* when you buy Fuld.

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DEODORANT BLOCK HOLDERS
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DISINFECTANTS
FLOOR SEALS AND TREATMENTS
INSECTICIDES
LIQUID CLEANERS
LIQUID, OIL AND BASE SOAPS
PLUMBING SPECIALTIES
POLISHES
POWDERED HAND CLEANERS
SOAP DISPENSERS
SPECIAL CLEANERS
TOILET ROOM CLEANERS
WAXES, LIQUID AND PASTE

ROUND UP PROFITS

Profits are realized in many ways . . . . Attractive , eye-appealing labels catch quick sales . . . . A favorably remembered label which conjurs pleasant memories of excellent product performance develops repeat sales. Round Up Profits based on the consistent quality of Fuld Bros., Inc. products and the integrity your name represents.

DESCRIPTIVE PRICE LIST

A really complete line of Sanitary Maintenance Chemicals is available to you. Write for our up-to-the-minute price book which contains a detailed description of each product.

QUALITY PRODUCTS SOLD EXCLUSIVELY TO RECOGNIZED JOBBERS

FULD BROS., Inc.

702 South Wolfe St.
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Los Angeles
Calif.

Manufacturers of Sanitary Maintenance Chemicals

A GUIDE

TO WAX PRODUCTS PURCHASING FOR PRIVATE BRAND RESALE

An honest appraisal of floor wax products as we see it is offered to guide wax buyers who want the best quality money can buy...

SELF POLISHING WAXES

Candy's Supreme—Candy's Supreme Special AS

Candy's DeLuxe—Bright Beauty

Four floor waxes that *are* all-around top quality for any given traffic condition. Each imparts the finest protection and beauty to floors for which they are best suited.

Bright Beauty FLOOR CLEANER

An outstanding material for removing even the heaviest wax film and dirt.... Brings neglected floors "back to normal." The *right* cleaning agent to insure the most efficient floor maintenance.

Bright Beauty CREAM FURNITURE POLISH

A cream furniture polish that spreads easily, polishes without excessive effort and imparts a deep impressive lustre. Too, it permits *repeated repolishing* with a dry cloth saving reapplications time and again; truly a very economical polish of very highest quality.

Bright Beauty PASTE WAX

A paste wax that is properly blended and refined from excellent quality solids and solvents that produce the best drying time and thorough evaporation. A wax that is easy to handle, having "creamy" consistency and stability throughout its stocking and usage period.

Bright Beauty LIQUID (spirit) PREPARED WAXES

Complete line of spirit dissolved waxes that meet a wide variety of demands for durability, color and types of usages. Each its own "Dry-Cleaner," they keep a surface waxed with a superb protective coating necessary to many difficult surfaces such as certain floors (where adaptable), bars, wallpaper, etc.

Bright Beauty GLASS POLISH & CLEANER and SILVER POLISH

As a Glass Cleaner (pink color) it applies evenly with little effort, wipes off easily with negligible "powdering" and produces an undeniable "feel" of cleanness to glass that is actually true in fact. Different in color only as Silver polish, it imparts a highly desirable lustre to all silver *without* abrasion and can even correct the abuses of scratchy, "quick-polish" inferior products.

Bright Beauty DANCE FLOOR WAX

Basic advantages are freedom from "balling up," thus does not gather dirt and impregnate the floor with hard spots difficult to remove... also is free from dusty effects. Adds the protective quality to expensive ballroom floors that means more "floor-years" to users everywhere.

Bright Beauty Heavy Duty PASTE CLEANER

Really *cleans* and *scours* more effectively and quicker than most scouring powders. Depending on application, it can clean to perfection even painted walls to provide a suitable repainting surface. 100% active, free from excessive abrasive quality, it frees almost every surface from all forms of foreign matter to perfection.

1. BEAUTY AND DURABILITY

should be considered together. Initial appearance is important, but for a waxed surface to remain beautiful it must be durable. Durability depends not only on resistance to the abrasion of traffic, but even more so on resistance to the collection of dirt and to discoloring traffic marks. Durability is really measured by how long the waxed surface maintains a nice appearance before the necessity of complete removal and re-waxing.

2. ANTI SLIP

qualities are necessary in a good wax as a matter of safety underfoot. This important quality does not necessarily require the sacrifice of beauty and protection which are the foremost original reasons for the use of a wax. Look for the proper balance—a wax film which is not excessively slippery yet which is not tacky and does not excessively collect dirt.

3. WATER RESISTANCE

is important, particularly when considering the possibility of wet traffic and the necessity for frequent damp mopping for the purpose of removing surface dirt. Overdoing this quality means greater difficulty in applying multiple coats of wax and may seriously increase the difficulty in removal when complete cleaning and re-waxing is necessary. Water resistance is important, but so is the quality of removability.

4. SOLID CONTENT

when expressed in percentage is not nearly as important as the *quality* of the solid content. When considering good quality, 12% of solids answers most needs for good planned maintenance programs. Two applications of 12% will give better results than one of 18%. However, the more concentrated material is useful for some programs of maintenance and particularly on "washed-out" floors, etc. Over-waxing should be avoided so that periodic complete removal will not be too difficult.

5. CARNAUBA WAX

is still the most important basic ingredient in our floor waxes. When refined and compounded with other important ingredients and "KNOW HOW," it aids materially in producing the most important features of a good floor wax... ALL AROUND QUALITY OF PERFORMANCE.

● **ALL AVAILABLE FOR PRIVATE BRAND ONLY**
We do not compete with our jobbers for consumer sales. We sell only to distributors, except for experimental accounts in Chicago essential to research.

Wax Specialists for over 55 years

Candy & Company, Inc.

2515 W. 35th ST., CHICAGO

SOAP and SANITARY CHEMICALS

Volume XXVI
Number 8
August 1950

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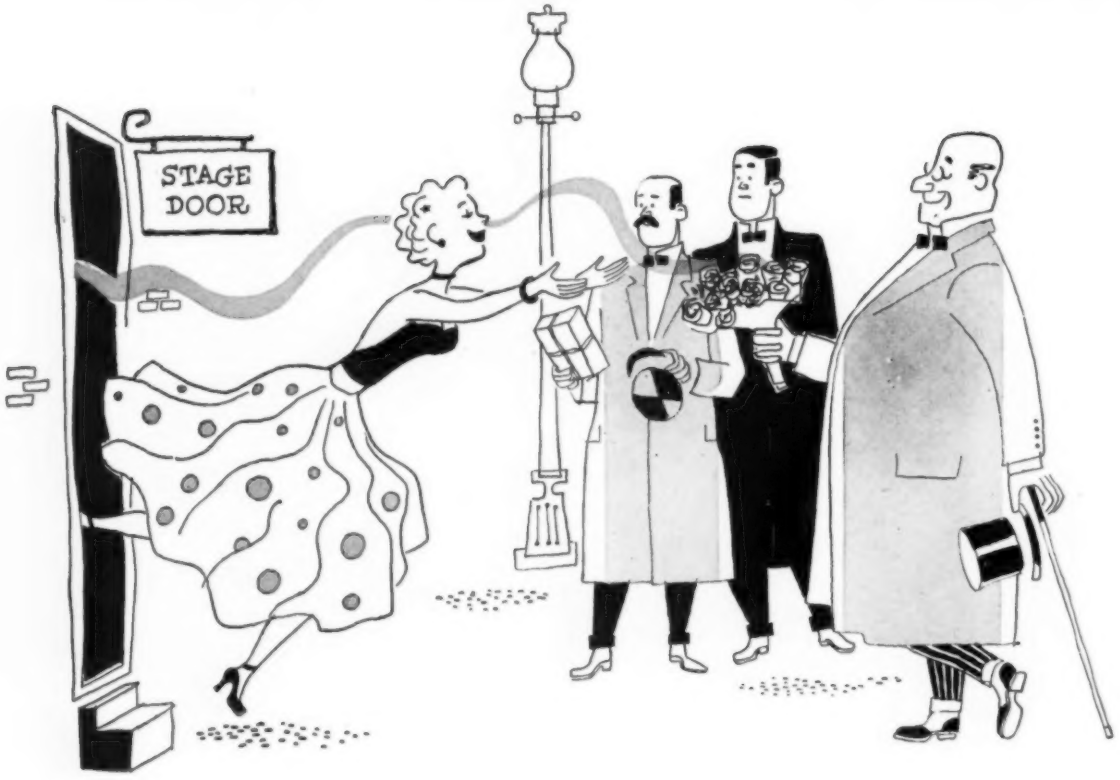

The Way to a Woman's Heart...

OR HER PURSE... is the *right* fragrance for your product. Finding the answer to your perfuming problems is easy when you consult with our chemists at Naugatuck Aromatics.

They have a wealth of experience in Basic Perfume Materials and Aromatic Chemicals and they will be glad to work with you.

They can show you how to mask or denature unpleasant odors of raw materials. They can show you how to add a sales-stimulating fragrance—or a neutral tone—to your finished product.

Write, or call us—soon!

NAUGAROMES—For various industrial and commercial uses.

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SHAMPAROMES—For liquid, cream and paste shampoos.

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DIVISION OF UNITED STATES RUBBER COMPANY

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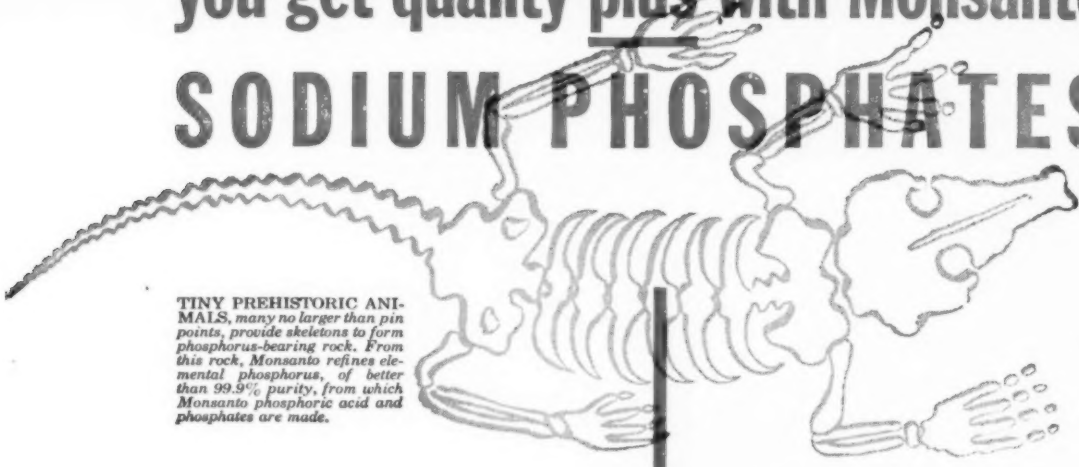
MANUFACTURERS OF AROMATIC CHEMICALS—IMPORTERS OF ESSENTIAL OILS

you get quality plus with Monsanto

SODIUM PHOSPHATES



TINY PREHISTORIC ANIMALS, *many no larger than pin points, provide skeletons to form phosphorus-bearing rock. From this rock, Monsanto refines elemental phosphorus, of better than 99.9% purity, from which Monsanto phosphoric acid and phosphates are made.*

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MONO SODIUM — Water treatment, textiles, acid cleaning compounds.

DI SODIUM — Cheese, leather, textiles, detergents, water treatment, dye, pigments.

TRI SODIUM — Water softeners, detergents, metal cleaners, water treatment, textiles.

TETRA SODIUM PYRO — Soap, detergents, cheese, textile dyeing, bleaching and finishing, metal cleaning, oil-drilling mud, water treatment, water softeners, glass degreasing.

TRI POLY — Soap, detergents, water softeners, textile dyeing, bleaching and finishing, degreasing, metal cleaning, clay refining.

ACID SODIUM PYRO — Baking powder, oil-drilling mud, electroplating.

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EVERY REFINEMENT IN MANUFACTURING AND HANDLING FOR SAFEGUARDING YOUR PRODUCT QUALITY

COLUMBIA Caustic Soda

Meticulous care in production and shipping makes Columbia Caustic Soda a high grade, dependable product . . . ideal for your most exacting use.

Columbia's patented purification process is a unique method which converts diaphragm cell electrolytic liquor to Caustic Soda of exceptional purity.

This purity is maintained throughout loading, transporting, and delivery . . . your assurance that Columbia Caustic Soda will always meet your requirements. Pittsburgh Plate Glass Company, Columbia Chemical Division, Fifth at Bellefield, Pittsburgh 13, Pennsylvania.

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Fusion welded car, eliminates rivets as a possible source of leaks and metallic contamination.

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Patented proportioning and cooling system simplifies unloading of 73%.

COLUMBIA CAUSTIC SODA IS SUPPLIED IN THE FOLLOWING FORMS:

Liquid 73% or 50%, Solid, Flake.

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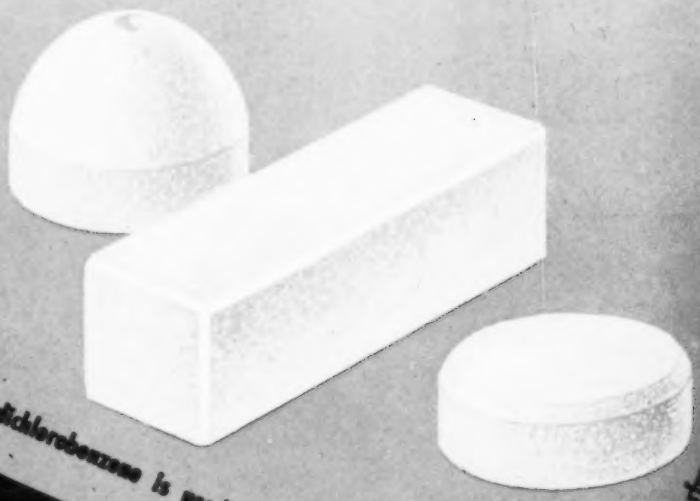
PITTSBURGH PLATE GLASS COMPANY



Only 100% Pure Paradichlorobenzene is used in All Hysan Deodorant Blocks PLUS selected perfumes that volatilize at the same rate as the para.

The Worlds Finest

DEODORANT BLOCKS

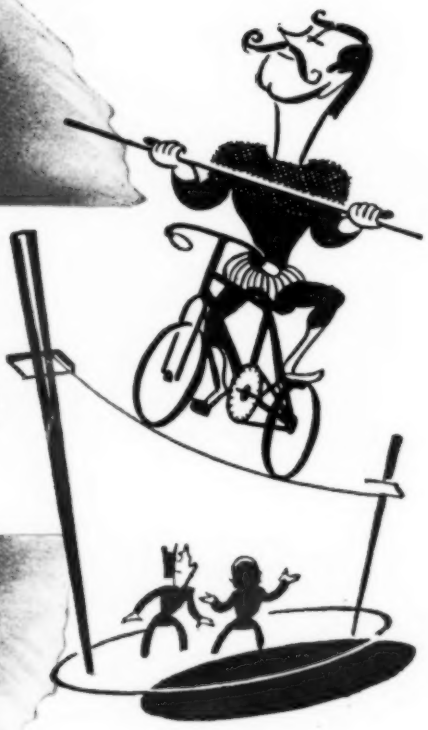
ARE MADE BY *Hysan*

WORLD'S LEADING BLOCK MANUFACTURER

WRITE FOR SAMPLE • *Hysan* PRODUCTS COMPANY—932 WEST 38TH PLACE—CHICAGO 9, ILLINOIS

Methocel:

the Excellent Emulsion Stabilizer



Do you have a product that needs stabilization—thickening? METHOCEL, Dow Methylcellulose, now in *powdered* form, is an outstanding emulsion stabilizer and thickener.

This versatile ingredient is bland, physiologically inert, odorless, colorless, stable in viscosity and uniform in its thickening properties. When used as an additive to shampoo, METHOCEL gives a stiffer suds, improved texture and lathering properties, and an added smoothness to the lather.

METHOCEL can also be used to extend soap by reducing fat consumption, to harden bar soap, extend liquid soap and thicken disinfectants.

Get acquainted with the *new* METHOCEL, *powdered*. Write or phone us for additional uses of METHOCEL in the soap and sanitary industry. Send for free, experimental sample of the *new* METHOCEL, *powdered*.

THE DOW CHEMICAL COMPANY · MIDLAND, MICHIGAN

THE new *methocel*

DID YOU GET YOUR SAMPLE?

The Dow Chemical Company
Dept. ME- R44A
Midland, Michigan

Please send free sample of METHOCEL, for use in_____
Check viscosity desired: 15, 25, 100, 400, 1500, 4000 cps.

Name and Title_____

Firm_____

Address_____

DOW

CHEMICALS

INDISPENSABLE TO INDUSTRY AND AGRICULTURE

all 10 floors never had it so good!

ALKATROL CONDITIONER-CLEANER FOR COMPLETE FLOOR TREATMENT

NOW! A new feature is added to this conditioner-cleaner

CHLOROPHYL in AIR-FRESHENING ODOR

In *one cleaning-conditioning operation* the floor surface becomes a giant dispenser that *freshens* the atmosphere throughout the *entire room area*. Literature available upon request.

Listed by Underwriters' Laboratories, Inc., as anti-slip floor treatment material.

ALL FLOORS Yes, *all* floors respond to this amazing CONDITIONER-CLEANER with original lustrous beauty and safety. Deeply imbedded dirt, dulling soap film and scum encrusted floors become *dazzling clean—completely revitalized!*

A LITTLE DOES A BIG JOB

It's powerful . . . effective in dilutions as low as 3% in hard, soft, hot or even ice water. It's absolutely safe for the most delicate surface. In fact, harsh alkalies on the floor are neutralized.

NO RINSING—LESS LABOR

Put it down . . . then take it up! Labor's dollar cost shrinks to mere pennies. Try it once and you will never rinse again.

SAFETY FACTOR FOR FLOORS

It is listed by Underwriters' Laboratories Inc., as ANTI-SLIP floor treatment material. This CONDITIONER-CLEANER creates a slip resistant surface for your slip-resistant wax. Enjoy greater safety underfoot. A free sample and informative literature is yours for the asking. Write us today.

BETTER PRODUCTS THROUGH CONTINUED RESEARCH • lab PRODUCTS • CHEMICAL SERVICE OF BALTIMORE

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HOWARD AND WEST STREETS ★ ★ BALTIMORE 30, MARYLAND

Manufacturers of quality waxes, soaps, cleaners, disinfectants, chemical specialties.

To Be of Real Service The Tool Must Fit the Job!

...*which makes* RENEX* *a standout among detergents*

RENEX is a powerful, low-cost, non-ionic detergent with "specialty" properties that make it ideal for use in compounding with other ingredients.

Here are the features which make RENEX outstanding:

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Write today for full story of versatile RENEX.

The famous Atlas SPANS* and TWEENS* are surface active agents that offer a complete range of solubilities in oil and water. They offer *you* the correct emulsifiers for any emulsion problem.

*Reg. U. S. Pat. Off.

ATLAS INDUSTRIAL CHEMICALS DEPARTMENT

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ATLAS POWDER COMPANY, Wilmington, Del. • *Offices in principal cities* • *Cable Address—Atpowco*
ATLAS POWDER COMPANY, CANADA, LTD., Brantford, Canada

NOW a NEW HIGH IN MOP PERFORMANCE and a NEW LOW in Mopping COST

Faster acting!
Longer lasting!
Lower priced!

Impartial laboratory tests have demonstrated that the type of cellulose and the spinning method used to form DURA-SORB yarn, result in a faster rate of absorbency than even mops offered at premium prices—by a margin of almost 2 to 1. And, because of DURA-SORB'S durability, users buy mop-heads less often. Finally, DURA-SORB is *not* extravagantly priced. All this combines to deeply slash the cost of mopping.

Use on Any Floor!

Here is a new man-made mop-yarn that is NOT fragile. It glides over rough and smooth floors . . . picks up completely. This, instead of tearing and leaving a trail of yarn bits in its wake.

Dura-Sorb
WET MOP

TEST IT FOR

RUGGEDNESS

Tests on your own floors, like laboratory tests, will prove that DURA-SORB yarn is amazingly tough—not spongy and fragile. Here's a mop-head with a new mileage record.

WATER ABSORPTION

An easy way to test DURA-SORB yarn for absorbency is to put a strand in a glass of water. Let one end overhang the glass. Note (1) how the yarn instantly sinks into the water, and (2) how the water syphons out in a stream of drops! Compare with any other yarn of any material.

RINSABILITY

DURA-SORB has a "greedy" affinity for water and grime. But it divests itself just as readily of its dirty load when wrung out or rinsed.

✳ We are the manufacturers of the nationally-famous BIG X DUST MOPS, VICTORY WET MOPS and HOLZ-EM APPLICATORS. Specification sheets on request.

For ROUGH and Smooth Floors:
The RUGGED

Dura-Sorb

TRADE MARK

SPUN CELLULOSE WET MOP

(Fits any standard mop holder
A size for every size floor)

AN AMAZING NEW! MOP YARN

We guarantee DURA-SORB is superior in performance to any other wet-mop of any material at any price—or your money back!

LEARN THE 3 R'S OF MOPPING BY ACTUAL TEST

RUGGED No need to "use only on smooth floors." DURA-SORB takes floors as they come. Use DURA-SORB on rough floors—any floor!

RAVENOUS DURA-SORB instantly licks up water and dirt on contact. Independent laboratory tests (ask for copy) prove DURA-SORB picks up faster and holds more water than much higher-priced mops.

RINSABLE DURA-SORB has a record-breaking ability to drop its load of dirt and grime instantly . . . Just wring out or hold under running water. It dries out soft and sanitary.

FILL IN, TEAR OUT, MAIL NOW

MAIL THIS COUPON

Make Your Own Test on Your Own Floors!

AMERICAN STANDARD MFG. CO. (Incorporated 1908) ✳
Charles E. Krebs and Walter O. Krebs
2515 S. Green St., Chicago 8, Ill.

Send us a sample of DURA-SORB yarn and specifications. Also quote on a trial shipment of *money-back-guaranteed* DURA-SORB mops.

MY NAME.....

FIRM NAME.....

ADDRESS.....

AQUAROMES

WATER SOLUBLE PERFUME OILS

(REG. U. S. PAT. OFF.)

CLEAR or CLOUDY
To suit your purpose
Felton "Clear Aquaromes" are completely soluble in water, leave no trace of oil film or cloudiness and delightfully and economically perfume a wide variety of products such as LIQUID SOAPS, SHAMPOOS, THEATRE SPRAYS, DEODORANT SPRAYS and many others.
Felton "Cloudy Aquaromes" mix readily with all water base products, to form a dense, milky, permanent cloud, pleasantly perfumed at a very low cost. Ideally suited for DISINFECTANT & DEODORANT SPRAYS, FORMALDEHYDE PREPARATIONS and AIR PURIFIERS.
Send us a sample of the product you want to perfume, either clear or cloudy, and our laboratory will recommend the correct AQUAROME.—Available in a wide variety of delightful odors.
FELTON Quality

FELTON CHEMICAL CO., Inc.

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MONTREAL • PARIS • PHILADELPHIA • SALT LAKE CITY • SANDUSKY
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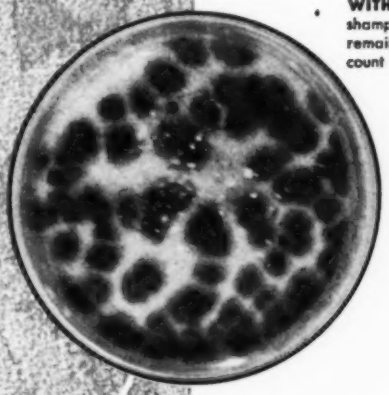

WITHOUT SANTOPHEN 1, rug shampoo removes dirt, but germs remain alive and active. Bacteria count 8,000,000 per cc.

SANTOPHEN 1 in rug shampoo kills germs, builds your sales

WITH SANTOPHEN 1, rug shampoo both cleans and destroys germs. Bacteria count is reduced from 8,000,000/cc. to 16/cc.

You can make your on-location rug shampoo a germ killer as well as a dirt chaser by adding a small amount of Monsanto Santophen 1. Assure your customers that *your product destroys dangerous germs* while removing unsightly dirt . . . without hazard to human beings or pets . . . and you have a sales point to *increase your volume and profit.*

Rug shampoos now being sold that incorporate Santophen 1 have shown that it can be added to the shampoo formulations without difficulty. It is stable and compatible with ordinary soaps and synthetic detergents. It prevents objectionable odors that sometimes arise from deterioration of rug shampoo residues. Santophen 1, properly formulated, kills mildew as well as bacteria. Its germ-destroying power remains in the carpet fibers long after the cleaning is finished.

Give your rug shampoo *extra* qualities and *extra* sales appeal with Santophen 1. For further information, mail the coupon or contact the nearest Monsanto Sales Office. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1778-F So. Second Street, St. Louis 4, Missouri.

Santophen: Reg. U. S. Pat. Off.

DISTRICT SALES OFFICES: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto (Canada) Ltd., Montreal.

MONSANTO
CHEMICALS FOR PLASTICS

MONSANTO CHEMICAL COMPANY
Organic Chemicals Division
1778-F South Second Street, St. Louis 4, Missouri

Please send information on the use of Santophen 1 in rug shampoos.

Name..... *Title*.....

Company.....

Street.....

City..... *Zone*..... *State*.....

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"Significant increase in quality . . . reduction in cost of supplies 50%."

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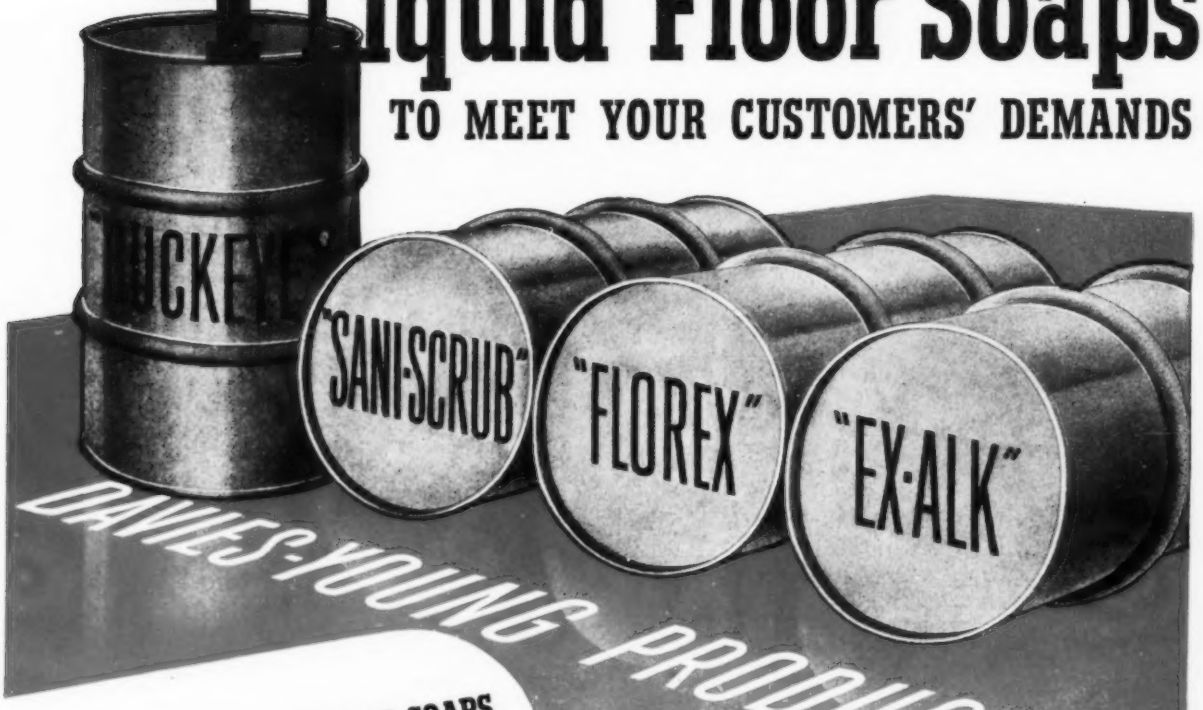

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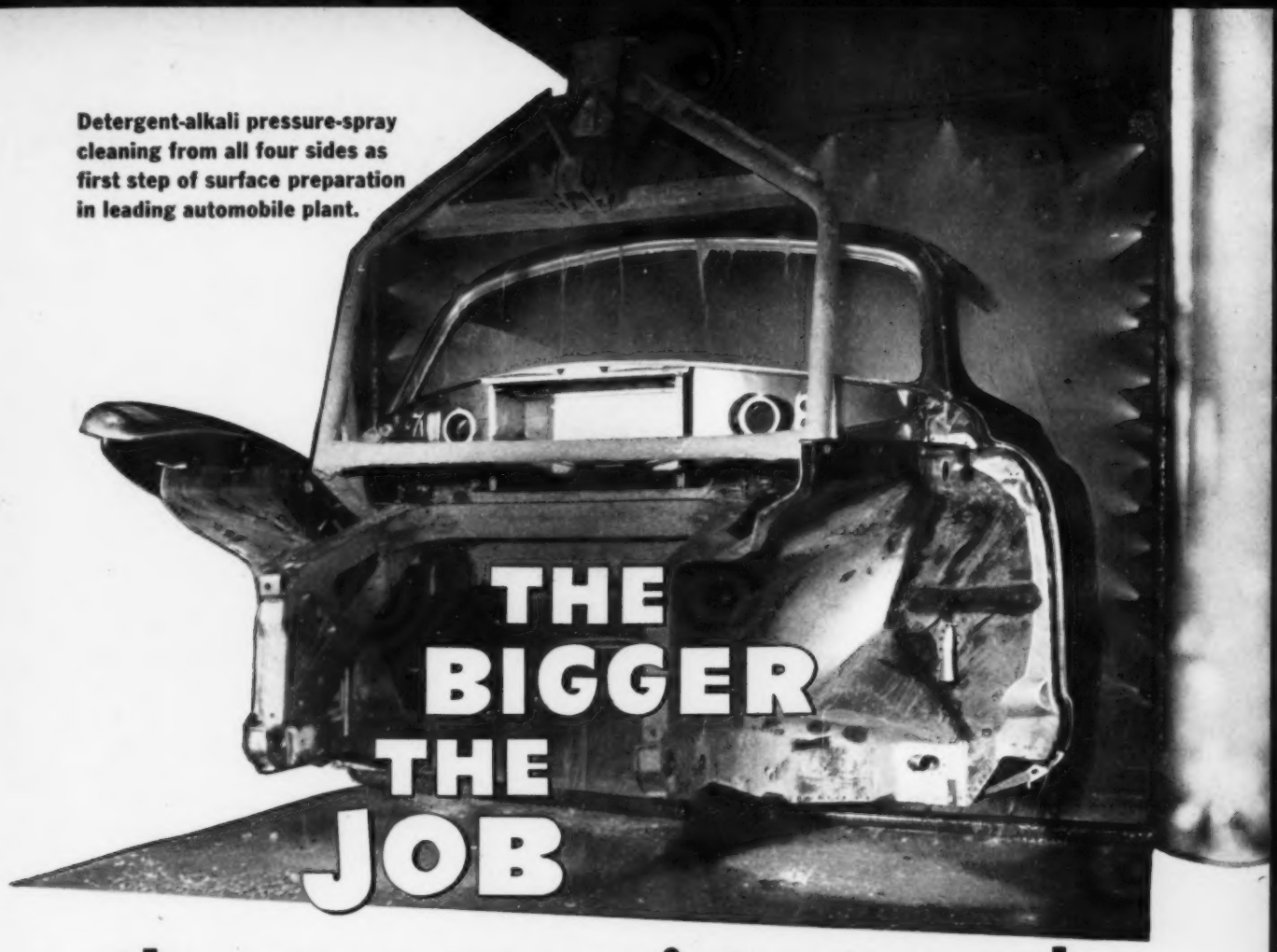

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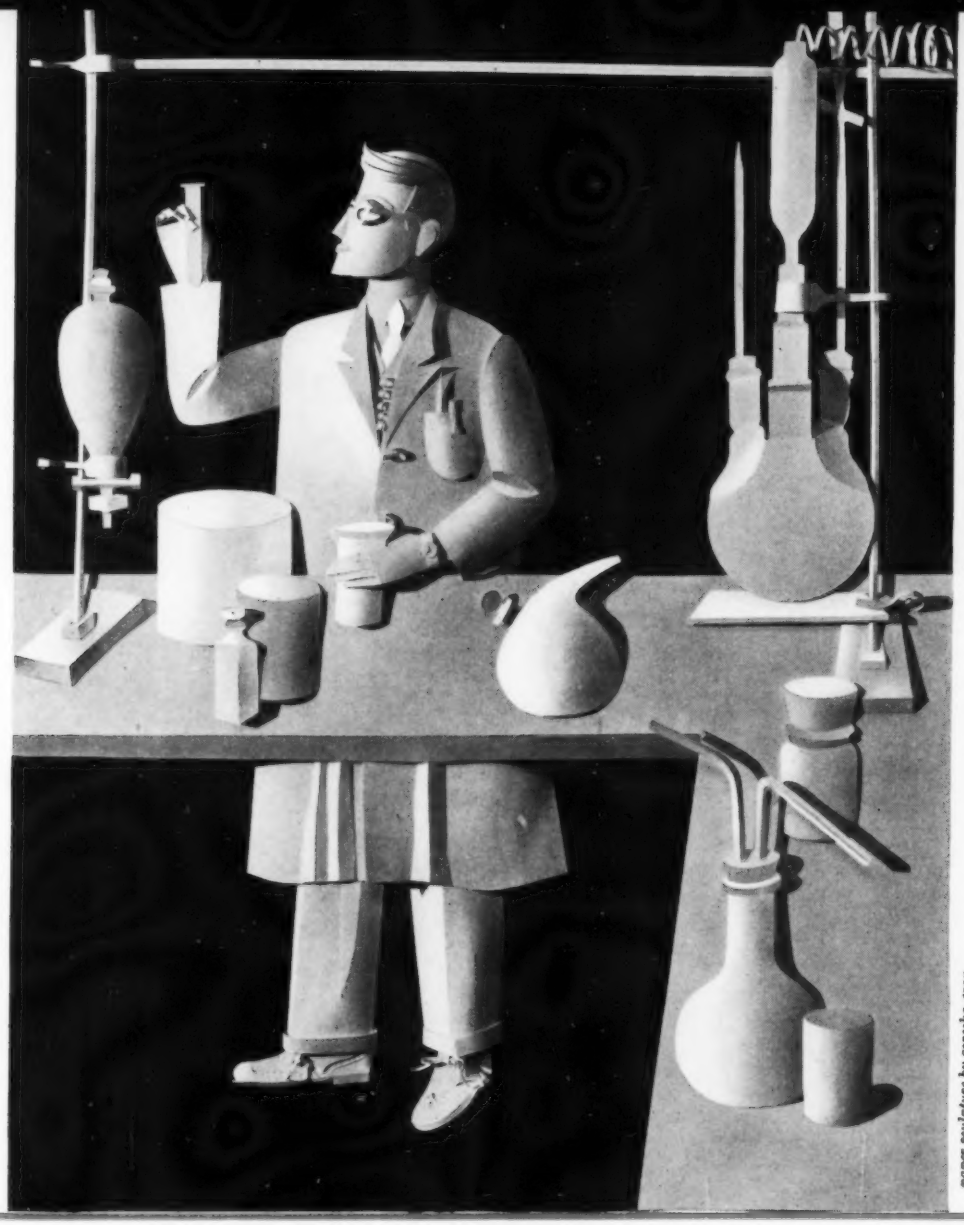

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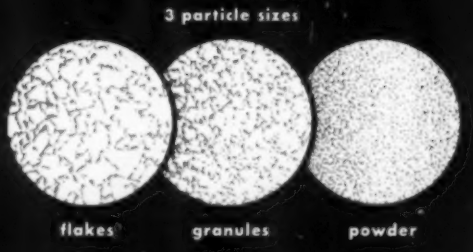

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Color 5¼" Lovibond Yellow	1.0 — 2.0	2.0 — 3.0
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Acid Value	206 — 209	206 — 209
Iodine Value	3.5 — 4.5	5.5 — 7.0

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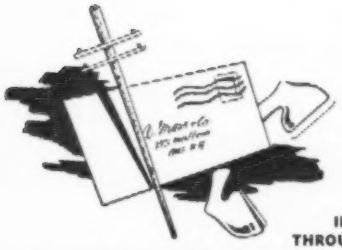

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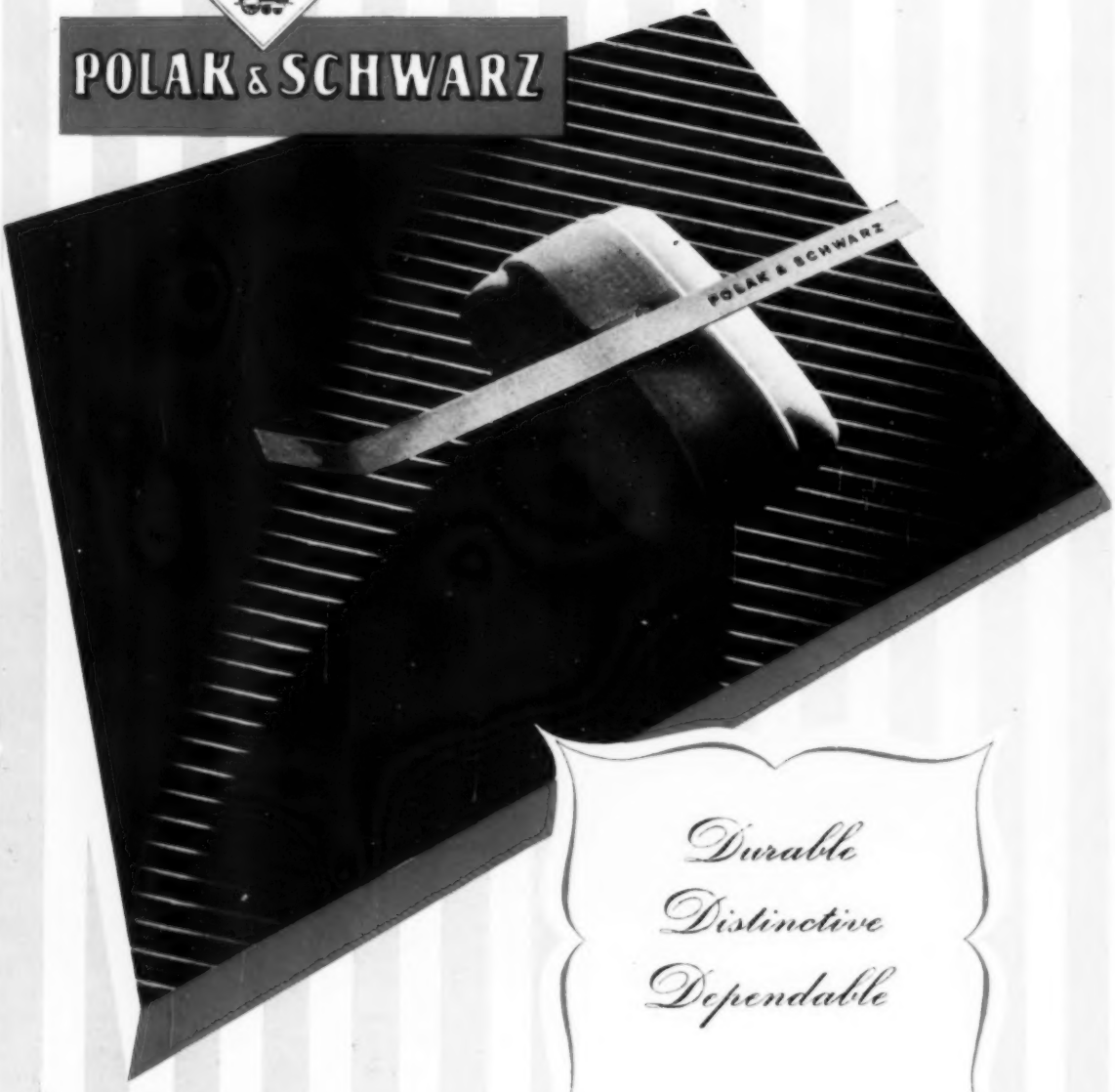

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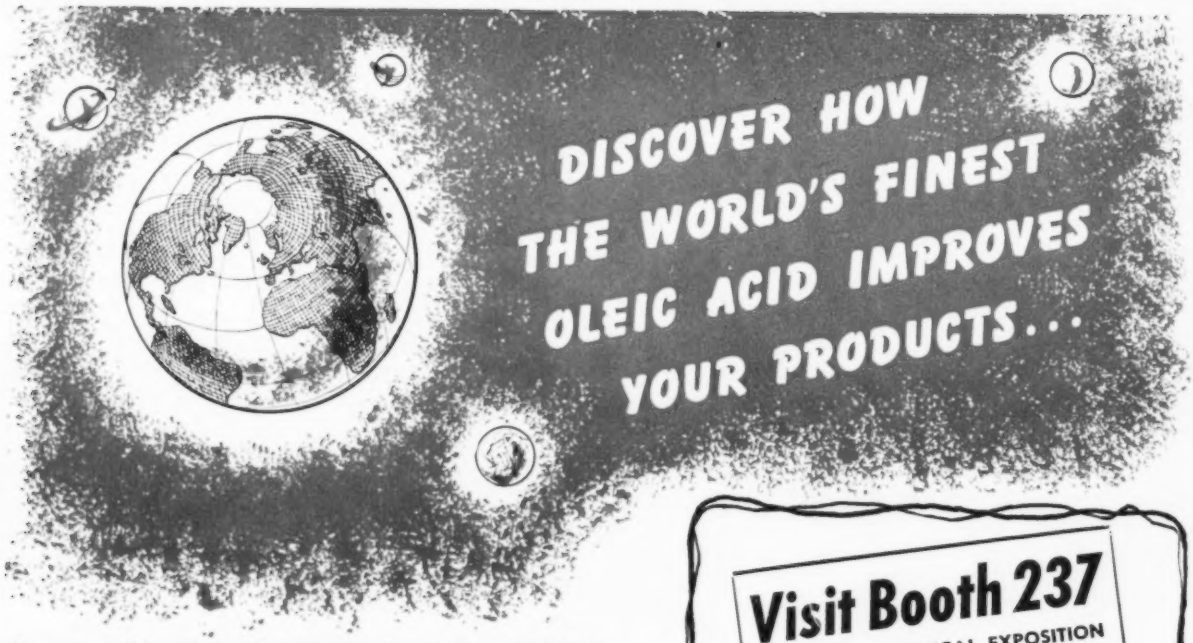

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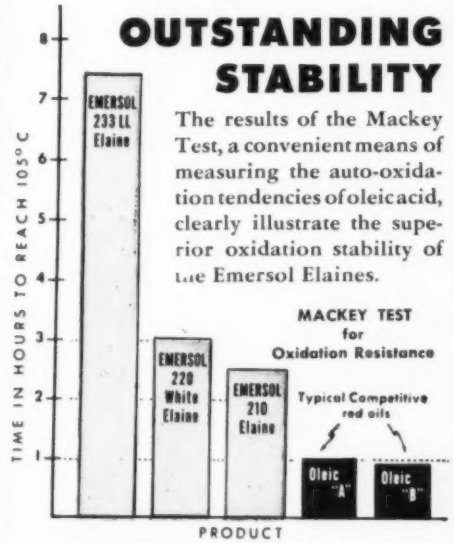

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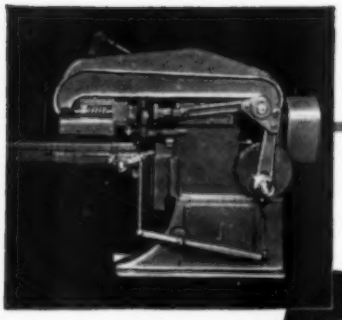
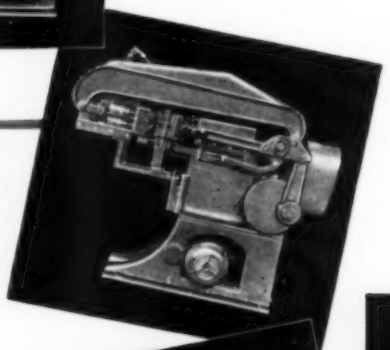


Type K Simplex Press

For toilet or laundry soap cakes of any shape (except highly convex cakes) with side band. Speeds of 120-140 cakes per minute.



Type K Duplex Press

Applications same as Type K Simplex. Presses two cakes simultaneously. Speeds up to 250 cakes per minute.

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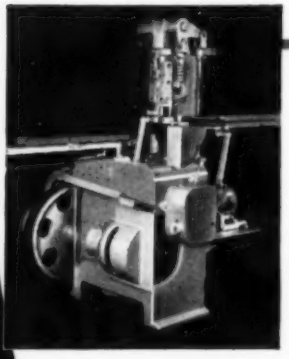
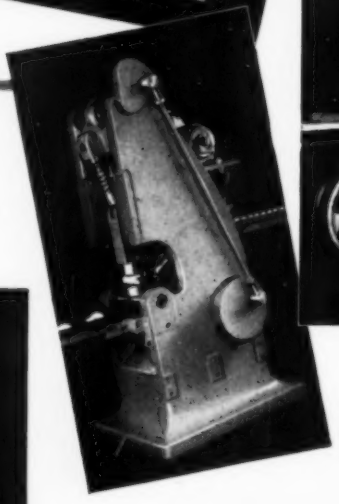


Type ET Press

For small toilet soap cakes with side band. Speeds up to 120 cakes per minute.

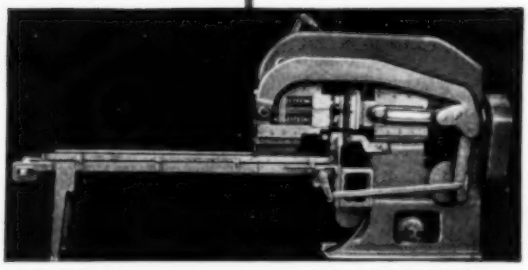
Type R Pin Die Press

For toilet soap cakes of unusual shape, oval cakes, or cakes having highly convex faces, with or without side band. Speeds up to 100 cakes per minute.



Type F Press

For large toilet or laundry soap cakes. Available in Simplex or Duplex Models, pressing one or two cakes per stroke.



Type E Press

For small toilet soap cakes (1½ oz. or less). Speeds up to 200 cakes per minute.

R. A. JONES & COMPANY, INC.

P. O. Box 485 CINCINNATI, OHIO

MANUFACTURERS OF JONES TOGGLE OPERATED SOAP PRESSES AND JONES CONSTANT MOTION CARTONERS

AS THE EDITOR SEES IT

WITH this issue, *Soap & Sanitary Chemicals* completes twenty-five years of publication. Usually such is the occasion to call up your friends in the industry and ask them to write you letters of congratulation which you duly publish in an "anniversary issue" replete with verbal orchids and silver ink. These published missives invariably run to a pattern of slush and mush about the high motives behind the founding of the magazine, how its publishers fought against great odds, but eventually emerged triumphant to save their industry from a life worse than death.

But, our story is different. Our motive in starting *Soap & Sanitary Chemicals* was the hope of profit. We felt that there was a need for the magazine back in 1925 and also believed that if it were to be profitable, it had to be good. So, we did our level best to make it good. As to profit, the magazine by and large has managed to get by without tangling with the sheriff. As to the quality and value of the publication, our readers over the years are better judges of this than we. Naturally, we hope that we have won and justified their confidence.

That we should admit brazenly in this day and age that our original motive was one of profit may seem unusual. After eighteen years of the new deal, fair deal, raw deal and what-not, it may seem out of step with the times. But, those are the facts. That the beginnings of *Soap & Sanitary Chemicals* were sordidly tainted with money cannot be denied. But in those days, it was considered honest and honorable to make a profit, private enterprise was doing pretty well for the country as a whole, sixty cents of each profit dollar was not engulfed in a sewer of government expense, and no Great White Father in Washington was trying to wet-nurse us from the cradle to the grave.

Nevertheless, we have managed to hang on for twenty-five years. To those of our readers who have stuck with us, we are fully appreciative, for without them there would have been no magazine. And to our advertisers who have supported us with their good, hard cash, we are deeply grateful, for without them too, there likewise would have been no magazine. So, as we plunge into our second quarter-century of this age of war and the welfare state, it is with the profound hope that sanity soon again may return to this cockeyed world.

SCARE BUYING of most everything has swept over the markets during the past month. Demand for chemicals has been frenzied, complicated by strikes at the plants of two large alkali producers. Tallow purchases were sufficient to drive the price up almost forty per cent in ten days. Bulk soaps reflecting the tallow move also were advanced by manufacturers, but even at the higher price, demand continued so heavy that soapers have been forced to allocate some products.

With the memories of World War II markets fresh in mind and the feeling that another full-scale conflict may impend, every buyer is trying to cover his future needs to the greatest extent possible, not to mention perhaps in some instances the hope of speculative profit. In their wild scramble, buyers have been driving up prices against themselves and making their own position extremely difficult. But what else can they do? The panic buying starts, and they must jump in and run with the pack or be left holding the bag.

In the case of most raw materials for soap, detergent and chemical specialty manufacture, stocks and production are ample to cover reasonable needs, with possibly one exception due to strikes, alkalies. A more calm, sensible approach could do wonders to reduce much of this panic buying. But, this is indeed a fond hope only.

To the credit of most of the large basic chemical producers, it may be said that they clamped down pronto to keep goods out of the hands of speculators and are enforcing strict allocations elsewhere. Only a continuation of this same firm hand can keep markets within reasonable bounds if the present situation continues.

IF an attempt were made to put a finger on the spark which set off waves of panic buying of everything from soup to nuts, not excepting soaps, we feel that many concerns might look into their sales departments. We do not refer to sales forces as a unit as much as to the activities, attitude, and talk of individual salesmen. If all the reports, responsible or otherwise, passed on to customers during the last month, were placed end-to-end, they could be calculated to cause only one thing, trouble. Some we have heard direct, others second-hand. But, they all spelled out a neat pattern of panic buying.

Anybody who has ever sold anything knows that the natural inclination is to curry favor with customers by "taking care" of them during times of stress. The salesman who hasn't done just this doesn't live. Then, consider a chance to boost sales quickly if you are on a commission basis. Who wouldn't strike while the iron is hot? Who wouldn't exaggerate perhaps a little to force the buyer's hand for a much larger order? Who hasn't predicted dire things for those who failed to buy now? With a threat of war hanging over us and a million salesmen on the road, the current situation in our opinion has been inevitable. Maybe those who hold the sales reins should have tightened them up a little sooner.

IN case of a full-scale war, coconut oil is not to be considered an essential soap manufacturing raw material. This, we hear, is the feeling of the powers that be in Washington. We went through a good part of the last war without coconut oil in our soap. So, if we can do it once, apparently Washington believes that we can do it again. We can. As a matter of fact, we even might get along without soap. A number of countries in Europe and Asia had little or no soap during World War II. If survival is actually at stake, then obviously this could be done, but we believe that the price which old-line soap manufacturers and renderers might pay would be high, very high indeed. Our feeling is that it would be their death knell.

If Washington is desirous of replacing the great bulk of American soap by synthetic detergents, then their classification of coconut oil as non-essential for soap and restrictions on imports for this purpose readily could accomplish their wish. A repetition of soap quality which marked most of that sold during the latter part of World War II could be nothing else but an invitation to synthetic detergents to take over in full. Then the cattlemen who raise, the packers who slaughter and the renderers who produce a billion or more pounds of inedible tallow per year could seek a new market for this product. Only there is no other market than the soap kettle for this quantity of tallow in the foreseeable future.

We hold no candle for soaps against synthetics, nor vice versa. We merely point out here what we believe is the hand-writing on the wall. If the cattle people and the renderers fail to see it, we feel that they should look again and weigh the fact carefully that they stand to lose a fifty million dollar market for their fat.

THE extent of rather than the need for controls and allocation of certain materials seems to be uppermost in the minds of Washington. A compromise—as usual—somewhere between the Baruch recommendation for all-out controls and rationing and the point of view of continued free marketing will probably be worked out. Let us hope that some of the many mistakes made in the handling of this situation in World War II will be avoided. Toward this end, may we recommend that in the event of the appointment of industry advisory committees, the groups be made truly representative of industry, and that full consideration be given smaller units about which such unusual solicitude is voiced by Government agencies—particularly in the matter of wage freezes, tax exemptions and quotas.

Cellulose Derivatives

In Soap

by Milton A. Lesser

CELLULOSE derivatives have had a definite influence on modern living. In the form of lacquers, plastics, rayons and cellophane they have led to the creation of new industries and to the manufacture of new products. The potentialities of these versatile materials have also influenced the thinking of investigators in other fields. Among them are those who have found that certain cellulose derivatives can be used quite advantageously in soap formulation.

More than a decade ago, the interest of European soap scientists was turned toward the benefits arising from the use of methyl cellulose. In 1939, for example, it was reported (1) that methyl cellulose was receiving considerable attention as a filler for both hard and soft soaps. It was also claimed that its use permitted a 30 to 32 per cent reduction in the fatty acid content of soaps.

In the United States, methyl cellulose is available under such trade names as "Methocel" and "Colloresin" and in Europe as "Tylose." Its production follows the usual methods for making cellulose ethers.(2) Cotton or wood cellulose is converted by strong sodium hydroxide solution to alkali cellulose which is then methylated with methyl chloride. Methyl cellulose is available commercially as a white fibrous product. It is neutral, odorless, tasteless and inert and is stable to heat, light, and aging. It is compatible with dilute acids, alkalies, most water-soluble resins, and wetting agents.

Methyl cellulose is generally produced in several viscosity types to meet a wide range of application requirements. It produces clear, colorless aqueous solutions which ordinarily do not require a preservative and which retain their viscosity over a wide pH range. According to Bergy (3), solutions of methyl cellulose are "completely harmless" to man when applied internally or externally.

Methyl Cellulose in Soap

BEFORE the war, a number of workers (4, 5, 6) had reported on the advantages of using methyl cellulose and had discussed procedures for incorporating it into soaps. It has been noted (1) that the viscous nature of even dilute solutions of the cellulose product seemed to warrant its use as a "body-contributing" substance in soaps. It had also been observed that the compound actually improved lathering and provided an emollient effect, but that excessive quantities tended to hinder the detergency.

In a report (7) published in 1939, it was pointed out that methyl cellulose is a valuable soap aid because it lowers the surface tension of water and helps to create a more persistent and copious lather. It possesses some detergent powers of its own and thus permits a decrease in the amount of fatty acid without lowering the quality of the soap. It also aids the keeping qualities of the soap and prevents efflorescence. In the manufacture of milled soap, it was stated, the addition of methyl cellulose increases the plasticity, so that the soaps are easier to work up.

More recently, in 1943, Smith (8) noted that small quantities of methyl cellulose, such as one to two per cent based on the weight of pure soap, can produce definite improvements. In his opinion, the following advantages may be claimed for the use of methyl cellulose in soap manufacture: (a) It increases the hardness of soap; (b) It improves the texture, sheen and general appearance; (c) It improves the lathering properties; and (d) It gives the lather a pleasing smoothness; this being a most valuable feature, especially for toilet soap. He also remarked that methyl cellulose tends to cloak the presence of inferior raw materials and that it is inexpensive to use.

Smith further pointed out that for optimal results it is necessary to select the most suitable grade of methyl cellulose. It is his opinion that the high-viscosity type of product is the

most economical and the most appropriate because it allows a relatively high viscosity to be maintained at a low concentration.

Incorporation in Soap

VARIOUS methods for incorporating methyl cellulose into soap have been suggested by different workers. Thus, in his earlier report, Smith (1) advised that a solution of one part of methyl cellulose in 15 parts of water can be incorporated to the extent of 10 to 20 per cent in soap while crutching. In his more recent discussion, he stated that the desired quantity of the cellulose compound is usually one to two per cent of the pure soap present. For use in the manufacture of toilet and household soaps, the desired quantity of methyl cellulose is first wetted with half the required quantity of water; this being used at the boiling temperature. The remainder of the water (unheated) is then stirred in. The viscous solution, which should be poured easily while containing the minimum quantity of water, can then be added to the soap. It should be mixed in thoroughly to insure even distribution throughout the mass.

In his review on the uses of methyl cellulose, Leddon (9) mentions that the following formula has been suggested when the compound is to be used in soap as a superfatting agent and as a filler:

	parts
Water	120
Caustic lye (38-90°Be.)	40
Methyl cellulose	40

The use of either caustic potash or caustic soda is determined by the type of soap being made.

This suggestion is in line with another method recommended (7) for incorporating the cellulose compound into soap. The first step is to prepare the cellulose solution, as follows:

	parts
Water, boiling	40
Caustic potash or caustic soda (40°Be.)	4
Methyl cellulose	4
Water, cold	52

Add the caustic to the boiling water, stir and add the methyl cellulose. Mix well and let stand for half an hour, then add the cold water, with stirring. Mixing is repeated on the next day to yield a smooth mucilagenous product. The solution is said to yield a very unctuous soap when caustic potash is used in its preparation.

The use of such solutions is illustrated in the following formula for making a hard soap with a fatty acid content of about 48 per cent:

	parts
Paste soap	100
Sodium silicate (36-38°Be.)	20
Caustic soda (40°Be.)	3
Water	3
Methyl cellulose solution	6

The silicate, caustic soda and water are mixed, brought to 70 to 80° C. and added to the soap. The cold solution of methyl cellulose is then incorporated a little at a time.

Another example is offered in a procedure for making a transparent soft soap. This calls for the use of:

	parts
Soap base	2200
Potassium hypochlorite (10°Be.)	150
Potassium chloride solution (10-20°Be.)	150
Sodium silicate (36°Be.)	100
Methyl cellulose solution	350
Caustic potash (40°Be.)	50

The soap base is prepared by saponifying 1000 parts of oil or fatty acid with caustic potash and adding the necessary potash. The other ingredients are incorporated and, after two to three days, the soap becomes transparent.

Methyl cellulose may be used advantageously in the preparation of various liquid soaps. For example, Smith (8) mentions that the addition of a little methyl cellulose helps to thicken a liquid shampoo without causing it to become cloudy or gummy. He suggests the inclusion of a small proportion of a wetting agent in the methyl cellulose before mixing it with the shampoo.

Several years ago, during the fat shortage, methyl cellulose was used in a method for extending scrub soaps. Although any given formula might need adjustment according to the type of fatty acid used, the basic formula that was recommended (10) contained:

	per cent
Methyl cellulose	0.4
Water	44.5
Dispersing agent ("Tamol NNO")	0.1
Wetting agent ("TRITON X-300")	5.0
Liquid potash soap (18-20% soap)	50.0

Dissolve the methyl cellulose in a portion of the water which has been heated to near the boiling point. Allow it to soak for 20 or 30 minutes, when the rest of the water is added cold and stirred until smooth. The dispersing agent is dissolved in a portion of the water, the wetting agent is added and the entire mixture is added to the soap to yield a clear solution. The wetting and dispersing agents specified in the above formula are manufactured by Rohm and Haas Co. of Philadelphia.

By using this formula the real soap content of the liquid cleaner is reduced to about nine to 10 per cent. Nonetheless, it is claimed that the formulation not only gives detergency results equivalent to those obtained from standard liquid soaps, but that, in addition, it adds wetting power, improves rinsability and is highly effective in hard water.

The value of methyl cellulose extends to other types of soap products. For instance, Leddon (9) observes that the cellulose compound will often help to improve the consistency of shaving creams, especially if they are based on caustic potash. An addition of less than nine per cent is usual.

Interesting and novel is the use of methyl cellulose in the manufacture of soap in sheet or leaf form. According to the patent (11), this is done by mixing an aqueous solution of methyl cellulose with a liquid soap material, such as a green soap. The resulting mixture is dried in the form of a thin film.

In passing it may be noted that methods for the determination of methyl cellulose in soaps have been developed. Details on the analytical procedures are provided in several foreign publications. (12, 13)

Of course, other cellulose derivatives have been advocated for use in soap formulation. One European patent (14), for example, de-

Cellulose derivatives, including CMC (sodium carboxymethyl cellulose) have been used during the past 10 or 11 years in soap as fillers, to impart softness and to increase detergency.

scribes how cellulose and its derivatives may be used, singly or in combination, as fillers in soap-making. In another patent (15), methods are given for incorporating water-soluble hydroxyalkyl cellulose or its derivatives into soaps prior to solidification.

Also interesting in connection with soap formulation is a British product known as "Promulsin." It has been rather vaguely described (16) as a stabilized, water-dispersible cellulosate consisting mainly of poly-galactoxylose and is said to represent an improvement over methyl cellulose. According to one note (17), "Promulsin" provides colloidal gels which impart a much higher degree of smoothness to soaps than can be produced by ordinary emollient agents. The derivative acts also as a suspending and dispersing agent for the soap colors and perfumes and, in addition, contributes to the production of a fine and stable lather.

Sodium Carboxymethyl Cellulose

THIS last brings to mind the advantages claimed for the use of sodium carboxymethyl cellulose. This is a most interesting cellulose derivative commonly referred to as sodium CMC or simply as CMC. In addition to these abbreviations, sodium carboxymethyl cellulose is also known by such names as cellulose gum and sodium cellulose glycolate (18). Commercially the product is sold under a variety of trade names, including "Carboxymethocel," "Collocel," "Colloresine V," and "Carbose." In England, it is available as "Cellofas WFZ" and in Germany as "Tylose HBR."

Sodium carboxymethyl cellulose is supplied as a white to light tan granular powder which is odorless and tasteless. It is made by treating alkali cellulose with the sodium salt of monochloroacetic acid. CMC is readily soluble or dispersible in water and very viscous, stable solutions can be made with it (2). As noted by Vaughn and Tremain (19), it is thought to be physiologically inert.

It appears that CMC has passed through two phases of development in the soap industry. The first phase is associated with its ability to improve the general characteristics of soap. The second phase is concerned with the derivative's ability to improve the detergent and associated properties of soap.

In 1942, it was reported (20) that "Cellofas WFZ," an English brand of sodium carboxymethyl cellulose (21, 22), could be incorporated into all kinds of soap with a number of ensuing benefits. It was said that the material imparts a softness and smoothness to soap superior to that provided by the more common superfatting agents. By incorporating the material at an early stage of soap manufacture, the material considerably facilitates later operations. For example, because of increased smoothness, the soap shows a reduced tendency to stick in the press.

Due to its colloidal nature, the compound serves as an excellent dispersing and binding agent for the colors and the perfumes. It was also found that, after a week in storage, the soap containing the cellulose derivative showed good hardness and complete freedom from "bloom." The inclusion also gave the soap a high polish and contributed to the production of a fine, creamy and lasting lather.

The report further provided details on methods for incorporating the sodium carboxymethyl cellulose into various kinds of soap. This is best done by adding the material in the form of a five per cent solution; boiling water being added to the requisite quantity of "Cellofas WFZ," with slow stirring until cold.

Thus, in the manufacture of cold process soap, it is suggested that the cellulose solution be added to the soap at the same time as, or in conjunction with the filler. A strong sodium silicate solution is recommended as the best filling agent for use with this cellulose derivative. An example of such use is given in the following formula; the cold CMC solution being added to the mixture at 80° C. with stirring:

	parts
Pure soap	100
Sodium silicate (70°Tw.)	22
Caustic soda (76°Tw.)	4
Sodium Carboxymethyl cellulose (5% solution of Cellofas WFZ)	4

In the case of a full boiled soap it is best to add the CMC solution to the neat soap in the crutcher at the same time as the color and perfume. Three pounds of the five per cent solution are added for each 100 pounds of soap containing 63 to 64 per cent of fatty acids. If the fatty acid content exceeds 80 per cent, as in the case of certain milled soaps used for toilet purposes or for making soap flakes, an increase in the amount of CMC may be desirable. Up to four pounds of solution per hundred weight of soap can be used.

CMC Improves Transparency

LIKE cold process soap and in similar quantities, curd soaps filled with sodium silicate can benefit from the addition of the CMC solution. It was also reported that soft soaps may be filled with the cellulose derivative, with a subsequent improvement in transparency. An example of such utility is given in the following formula:

	parts
Soft soap	250
Sodium silicate (70°Tw.)	5
Caustic potash (77°Tw.)	5
Sodium Carboxymethyl cellulose (5% solution of Cellofas WFZ)	5

It is noted that the alkalinity of the soap at the end of the process must be enough to cause the soap to show a slight darkening. The free

caustic potash content may range from 0.6 to 1.2 per cent.

The advantages of using CMC are also indicated in the literature (23) of an American supplier of brand name products ("Colloresine V" series), which is sold in three viscosity types. Because of their excellent stability to alkali, it is suggested that these materials can be incorporated directly into the soap mass during manufacture. One to two per cent of such a material of the medium viscosity type, applied directly to the soap mass, is said to be able to control the viscosity of the soap solutions. It also imparts firmness and binding properties to the hardened soap. In the manufacture of high grade toilet soaps, these cellulose derivatives are stated to give a better product with a high luster.

Insofar as American soap makers are concerned, the use of sodium carboxymethyl cellulose to promote detergency may be considered a postwar development. This second phase of utility began when, at the end of World War II, Hoyt (24) reported that certain forms of sodium carboxymethyl cellulose had been used in Germany in large quantities as soap and synthetic detergent extenders. It has been pointed out (19) that the applicability of CMC as detergency improver was not recognized in Germany until 1935. Five years later, the I. G. Farbenindustrie recommended that one of its carboxymethyl cellulose derivatives, "Tylose HBR," be used with fatty acid soap products and synthetic detergent mixtures.

In the United States, the first general disclosure of the possible value of CMC as a detergent improver came with Hoyt's report. Since then a good deal of American research has centered about the value of sodium carboxymethyl cellulose as an adjunct to synthetic detergents (19, 25). However, a number of investigations (26, 27) have also revealed that CMC is a highly effective detergency promoter in soap formulations.

Data along these lines have been provided in both comparative studies and in work on soap products. For example, Armstrong and his associates (28) included a low titer textile soap among the several synthetic detergents being investigated with respect to the effects of sodium carboxymethyl cellulose. Soap was included, they explained, because any improvement in low titer soap would make it of interest in scouring operations where the more efficient high titer soaps are used. The high titer soaps, they pointed out, have the disadvantage of being more difficult to dissolve and rinse out.

Their studies indicate that CMC has a high degree of efficiency in improving the detergent properties of both synthetic detergents and soap. The mode of action is to improve the soil suspending properties of the system rather than to promote actual soil removal ability. In this respect, CMC proved superior to various other agents proposed for the same purpose. It was noted, however, that the effect produced by the cellulose derivative is more pronounced with the synthetics than with soap because of the inherently poorer suspending properties of the former.

Very indicative are the studies of Bayley, Weatherburn and Rose (29) on the influence of sodium carboxymethyl cellulose on the suspending power of built and unbuilt soaps. In their study, soap or soap-builder solutions at certain fixed concentrations were taken as the basis for comparison. The suspending powers of these solutions were compared with those of solutions in which a part of the soap or soap-builder content was replaced by a proportionately smaller amount of CMC. A commercial laundry flake soap was used and the builder consisted of a commercial hydrated sodium metasilicate.

From these investigations it was concluded that the use of CMC with the straight soap solutions is of no particular advantage. In contrast, however, was the opinion that the use of the cellulose compound with mixtures of soap and builder is desirable. In such combinations it compensates, to a considerable extent, for the reduction in suspending power caused by the builder. At the same time, CMC permits a reduction in the quantity of soap used. From this, it seems evident that there are certain efficiencies and economies to be derived from a formulation consisting of soap plus builder plus sodium carboxymethyl cellulose.

Very pertinent in this connection are the reports of the Dutch worker, Nieuwenhuis (30). He stated that washing tests at 60° C. on artificially soiled cotton fabric show that a solution containing 0.6 Gm. of fatty acid as the sodium soap, 0.5 Gm. of sodium carboxymethyl cellulose ("Tylose HBR") and six Gm. of soda ash, per liter, has a greater suspending power than a solution containing two Gm. of fatty acid as soap and six Gm. of soda ash per liter. In addition, the all-over washing efficiency was found to be at least equal.

In a more recent communication, this investigator (31) also noted that sodium carboxymethyl cellulose in combination with common soap entails a substantial economy as compared with the use of soap alone. He also reported that for the last few years many Dutch laundries have been buying the ingredients—sodium soap, CMC, and soda ash—as such. This, of course, affords further economies.

In view of these findings it should not be surprising that in their new text on soap and detergents, Thomssen and McCutcheon (32) remarked that sodium carboxymethyl cellulose is being used in increasing quantities as a soap builder. They note that it has the property of stabilizing lather and preventing the redeposition of soil on the fabric in laundry operations.

It has been said (27) that CMC may also be highly advantageous in products based on both soap and synthetic detergent in combination. An example of such utility is offered in the literature (33) of a manufacturer of nonionic detergents, in the following composition for an improved built tallow soap:

	per cent
Tallow soap (88%)	10
Nonionic detergent ("Renex")	10
Sodium carboxymethyl cellulose (low viscosity)	1
Water	9
Sodium carbonate	55
Tetrasodium pyrophosphate	15

It may also be recalled that a

(*Turn to Page* 82)

Perfuming of Liquid Soaps

By Andrew Treffler

Methods of solubilizing almost any kind of perfume and some fatty substances, such as lanolin and lecithin, etc., into concentrated stock solutions described.

PERFUMING soaps in the paste phase usually does not require much skill if the correct ingredients have been chosen. Difficulties begin to arise as soon as the soapmaker is faced with the problem of perfuming liquid soaps made in the neutral unperfumed state, without affecting the clarity of the product. Coupling agents, such as denatured alcohol and isopropanol, when mixed with the perfume are helpful in putting certain kinds of perfume into the soap solution. In the majority of such blends, however, a more or less visible cloudy disturbance of the soap solution results. The condition indicates incorrect and insufficient coupling by which the quality, stability and eye appeal of the final product are reduced.

Larger companies, producing and storing their diversified liquid soaps in more sizable quantities, usually add the perfume during the processing of the soap. In this way, the two factors of heat and a somewhat higher soap concentration are utilized for incorporating the perfume in the soap.

Smaller companies, with lesser storing facilities, should store their soap, unperfumed in one or two tanks, add the required perfume in solubilized form to drum lots before shipping. This, of course, presupposes that they have a simple method to solubilize their perfume material, so that it dissolves clear in water or at least in soap.

In the following discussion, ways and means are described to solubilize almost any kind of perfume and some fatty substances, such as lanolin and lecithin, into highly concentrated stock solutions.

In concentrated soap solutions, the molecules are found in the form of crystallites of macroscopic size. The molecules are joined together by two forces, the methylene chains by the weaker van der Waals forces or residual bonds, the carboxyl alkali groups by the stronger ionic forces. The methylene chains in saturated fatty acids, aliphatic alcohols and ketones form plane zigzag chains of carbon atoms, and are arranged with their main axes parallel to each other. They have their planes mutually inclined in two different directions, thus giving rise to a close packed arrangement. Close packed arrangements are also found in highly hydrophobic benzol and naphthalene ring structures having no polar groups such as —OH, =O, —NH_2, etc.

By diluting concentrated soap solutions with water and heating, the residual bonds, especially on the short methylene chains and benzol ring structures, are weakened and disappear almost entirely. The crystallites break up into small dispersed fractions and the water molecules surround more and more of the dipolar carboxyl alkali groups. Upon cooling, the residual bonds reappear. The less dilute soap solutions return to the crystallite formation and the more dilute solutions to micelle formations. Aromatic substances, dispersed in small percentages among these formations, orient themselves to their new surroundings by means of their polar groups and their residual forces. They adhere to molecules of the same or similar characteristic shape, not changing essentially the refractive index and, therefore, the clarity of the original solution.

Among the fatty acids used in liquid alkali soaps and suitable for solubilizing perfumes are three groups: the saturated fatty acids, the unsaturated fatty acids and the rosin acids.

Fatty Acid Structures

THE saturated fatty acids, as mentioned already, form a plane zigzag chain of carbon ions. Their straight line up of electrons and nuclei, rotating in the same direction, form a magnetic field which increases with molecular lengths. This results in increased residual bonds and a higher melting point. The residual bonds in potassium stearate, palmitate and myristate are so powerful that the formation of crystallites can be observed even in very dilute solutions. One per cent solutions of these soaps form jels at room temperature. For solubilizing perfumes directly, therefore, only the low and medium molecular weight fatty acids of this series are suitable.

The unsaturated fatty acids no longer form a plane zigzag chain of carbon ions. They are bent at the unsaturated groups, due to close contraction of the two carbon atoms, each deprived of one hydrogen electron in the outer shells. The residual bond—magnetic field is interrupted and the melting point lowered. Stearic acid has a melting point of 69°C. In oleic acid, with one unsaturated group, the melting point is lowered to 5°C.; in linoleic acid, with two unsaturated groups, it is lowered to 11°C. The knee deformation of the unsaturated fatty acids more nearly approaches the shape of an aromatic ring and therefore, makes them more suitable for solubilizing aromatic chemicals.

The rosin acids with benzol ring structures seem to be the perfect acids for emulsifying pure aromatic

substances. Many aromatic substances contain the aryl group with an alkyl group, and it can be said that most perfume blends constitute a mixture of ingredients having both groups. A fatty acid composed of aryl and alkyl groups seems to be still more fitted for this purpose. Such an ideal fatty acid is refined tall oil. Its composition is about as follows:

	Per cent
Rosin acids	45.4
Fatty acids (unsaturated)	47.8
Sterols	6.6
Moisture	.2

By saponification with caustic potash, a clear, water soluble product is obtained. The sterols, having a very high molecular weight and being highly hydrophobic, in this case are already solubilized. They are taken up into the crystal structure of the very closely related rosin acid soaps and are not obstructed by the fatty acid soaps. Vegetable oils in the refined state may contain up to three per cent unsaponifiable matter. The 6.6 per cent sterol content of tall oil indicates the ability to solubilize very well. Perfume blends are far less hydrophobic than sterols. They represent a coupled arrangement of more or less oxidized aromatic chemicals, essential oils and soluble resins. Sometimes, they contain a coupling agent, extended to the emulsifying agent and, therefore, are solubilized more easily.

First Method Described

VERY good results in solubilizing perfumes can be obtained by using 15 per cent tall oil, 15 per cent perfume, three per cent caustic potash, 57 per cent water, 10 per cent alcohol and forming the soap stabilized emulsion by making the soap *in situ*. The perfume is dissolved in the tall oil, the caustic potash dissolved in water and the ingredients mixed without heating. At this point, the alkalinity of the emulsion is corrected. Phenolphthalein indicator should turn the sample a faint pink. If the solution fails to clear, then the 10 per cent alcohol (isopropanol, diethylene glycol, butylcarbitol or others) is added. In many cases, the addition of alcohol is not necessary, and water can be substituted for the 10 per cent alcohol. The 15 per cent perfume stock solutions mixed in at room temperature are taken up by clear 20 per cent coconut oil soap. When adding perfume stock solutions to a highly concentrated 40 per cent coconut oil soap, it is best to first dilute the soap with water to suitable concentrations.

Among the synthetic detergents there are many with aryl and alkyl radicals. The structural formula of aromatic chemicals can be matched very closely with them, especially if two or three detergents are blended together. One of the lowest priced synthetic detergents has proved also to be the most useful emulsifying and solubilizing agent. It is referred to as a petroleum sulfonate, often called mahogany soap.

By treating unrefined mineral oil with fuming sulfuric acid, a sulfonation of the aromatic naphthenic and also of some of the paraffinic substance takes place and forms the acid sludge. This settles out and is neutralized to the sodium salt. By an analysis a new classification of petroleum sulfonic acids has been established. It divides them into mono- and dibasic acids. The two major monobasic acids are the oil soluble and oil insoluble monosulfonic acids. The third group represents oil soluble, disulfonic acid. Mean molecular weights range from 400 to 600. Table I represents the classification of the results of the analysis.

TABLE I

Hydrocarbon type	*Oil-soluble mono-sulfonic acids*	*Oil-insoluble mono-sulfonic acids*	*Short chain di-sulfonic acids*	*Highly aromatic disulfonic acids*
% Aromatic rings	38.8	55.4	66.3	80.8
% Naphthalenic rings	18.0	32.2	9.6	19.3
% Paraffinic chains	43.3	12.4	24.1	0.0

The commercial product usually contains large amounts of mineral oil and salt. Mineral oil contents of 45 per cent are not unusual. They are an indication of the high bonding strength of the sulfonates, representing an arrangement of properties required for the emulsifying of perfumes. Based on his investigations with it, and as outlined in table II, the writer believes that a mahogany soap, free from mineral oil and salt, should be the per-

TABLE II

Solubility chart of alcohols and aromatic substances in 15% emulsifying agents

	Soluble in 15% solution of			
Substance	*K-oleate*	*K-coconut oil fatty acid soap*	*Petroleum sulfonate*	*K-abietate*
octyl alcohol	at 162°F. 1-3%	at 100-160°F. 1-3% at 160-200°F. 3-4%	at 120°F. 1-2% at 120-165°F. 2-3%	at 165°F. 1% at 210°F. 2%
oleyl alcohol	at 210°F. 1-2%	at 200°F. 1-3%	at 195°F. 1-3%	at 140-160°F. 1-3%
acetophenone	at 40-80°F. 1-3%	at 40-70°F. 1-7% at 70-100°F. 7-9%	at 35-40°F. 1-10% at 40-70°F. 10-13% at 70-90°F. 13-15%	at 70°F. 1-2% at 80°F. 3% at 80-94°F. 3-15%
benzophenone	at 120-130° 1-2%	at 120-130°F. 1-2% at 130-160°F. 2-3%	at 120-130°F. 1-8%	at 120-130°F. 1-6%
Pine oil	at 40-68° 1-5%	at 40-68°F. 1-7%	at 40-68°F. 1% at 85-95°F. 2-3%	at 135°F. 1%

fumer's choice for solubilizing his products.

In order to evaluate the performance of the petroleum sulfonate in solubilizing alcohol and aromatic substances a comparison is made with K-oleate, K-coconut fatty acid soap and K-abietate. Used with them is a 15 per cent solution of each emulsifying agent and different aromatic substances, such as a medium and high molecular weight alcohol (octyl and oleyl), a low and medium molecular weight benzol ring structure (acetophenone and benzophenone). The solubilizing property has been determined by stirring at room temperature and higher the largest possible percentage of aromatic substance into the different soap solutions, without leaving a turbidity.

The results obtained in these experiments, listed in table II, proved that the shape of the molecules is of fundamental importance in their adhesion to an emulsifying agent.

Octyl alcohol is taken up more readily by the less viscous coconut oil soap at lower temperatures than by the more viscous oleate soap, which requires heating to break up into smaller fractions, thus offering more surface for attachments. The longer hydrophobic end of the oleic acid, responsible for its viscosity, becomes more hydrophobic and viscous with this new water insoluble attachment. A two per cent octyl alcohol emulsion is very viscous to begin with, a three per cent emulsion is a paste. Coconut oil soap, until it turns viscous, is able to take up a higher percentage. Petroleum sulfonate, carrying mineral oil, is not as completely clear as a 15 per cent soap solution, but is cleared up by the addition of octyl alcohol, whose hydrophobic end apparently attaches itself to the mineral oil. The polar—OH group seems to make contact with the polar group of the sulfonates, acting as a coupling and clearing agent. The hydrophobic attachment turns a one per cent emulsion into a clear jel. K-abietate with its benzol ring structure, having a very little in common with the straight hydrocarbon chain of the alcohol develops very little adhesion.

Oleyl alcohol in K-oleate solution is less soluble than octyl alcohol, which is less soluble than methyl alcohol as a result of the length of the hydrophobic end. Coconut oil soap and petroleum sulfonate have to be heated, but require lower temperatures for solubilizing it than K-oleate. K-abietate solution, not showing any affinity for the straight hydrocarbon chain of octyl alcohol, offers the best pick up at lowest temperatures for oleyl alcohol bent on the unsaturated group.

Acetophenone is taken up by K-oleate and K-coconut oil soap, but to a lesser extent than by petroleum sulfonate and K-abietate, which, in their structural formulae, approximate more closely acetophenone. The small molecular weight of acetophenone with the ketone group makes it less hydrophobic and more penetrating and easier to accommodate in the soap structure.

Benzophenone has a melting point of 120°F. and to be dispersed in the soap solution must be heated above this point. The higher molecular weight makes it less penetrating. The higher melting point leaves the molecules some residual bonds above the melting point, making benzophenone less dispersible. Petroleum sulfonate and K-abietate are also preferred structurally by benzophenone as emulsifying agents.

Pine oil has no benzol ring structures in its constituents, as petroleum sulfonate and K-abietate are not suitable for emulsifying it. The K-oleate solution begins to form a clear paste between three to five per cent pine oil content, then it clouds up first by taking in air and finally by oversaturation with pine oil. At about 20 per cent content the pine oil takes up the soap by reverting the emulsifying process. K-coconut oil soap with the smaller hydrophobic end forms a paste with a pine oil content of from five to seven per cent. At the same temperature, it begins to cloud up at eight per cent.

Petroleum sulfonate in these investigations proved to be a superior emulsifying agent, very similar in its efficiency to tall oil. A combination of tall oil soap, petroleum sulfonate and isopropanol, as diluent and coupling agent, seem to be the logical components of another emulsion base for aromatic substances.

TABLE III

Solubility chart of 5 cc aromatic substances mixed with 15 cc solubilizing base (consisting of 2 parts petroleum sulfonate, 2 parts 80% K-tallate soap, 1 part Isopropanol) in 10 cc water, additional water of 15% K-coconut oil soap.

Blend of 15 cc base and 5 cc of aromatic substance	*Dissolves in*		*10 cc water followed by excess of 15% K-coconut oil soap*
	10 cc water	*Additional water*	
anisic aldehyde	not clear	not clear	not clear
acetophenone	clear	clear	clear
amyl cinnamic aldehyde	clear	clear	clear
amyl salicylate	clear	not clear	clear
benzaldehyde	clear	clear	clear
benzylacetate	clear	not clear	clear
bromstyrol	clear	clear	clear
citronellal	clear	clear	clear
citronellol	clear	not clear	clear
geraniol	clear	not clear	clear
ionone	clear	clear	clear
isoeugenol	clear	not clear	clear
linalool ex Bois de Rose	clear	not clear	clear
methyl anthranilate	not clear	not clear	clear
methyl salicylate	clear	not clear	clear
actyl alcohol	clear	not clear	not clear
phenyl ethyl alcohol	clear	not clear	clear
safrol	clear	not clear	clear
terpineol	clear	not clear	clear

Another Emulsion Base

A PRODUCT with the consistency of a medium heavy oil finding many applications as a base for solubilizing perfumes is composed of a mixture of the following:

(*Turn to Page 157*)

Germicidal Liquid

By A. G. Bowers*
Hunt Manufacturing Co.

THE subject of G-11** in soaps has been covered fairly thoroughly by many authors and in numerous journals. Its excellent germicidal or degerming action of the skin is well known. So far no flaw has developed in its use for this purpose. We have not heard of any build up of G-11 resistant germs. Its deodorizing action has made it possible for those timid souls who fear the risk of offending to sally forth among those who are not so afraid.

The use of G-11 soaps in the home has grown to enormous proportions. I hope that the use of medicated soaps in restaurants, other food handling establishments and industrial plants will grow much faster. Hospitals have excellent degerming techniques and medicated soaps make these techniques easier to apply. I do not always find that these techniques are employed by the hospital kitchen or outside personnel. With effective degerming soaps available, these employees should have established for them a rigid schedule of washing with such soaps.

In approaching these outlets, I find that the sanitary supply industry is not very clear about the product it sells. There is considerable confusion as to what two per cent or one per cent G-11 soap is. How much G-11 does it actually contain? It is necessary that this fact be established for liquid soaps, even more clearly than for bar soaps. It is important to know the ratio of G-11 to soap.

It is also important to know if the soap has been tested by a technique that eliminates the inhibiting action of G-11. I have seen several pieces of literature using the modified Price (1) technique. I am fairly certain that medicated soap was used to obtain the bacterial wash in the basins. This gives beautiful results, but makes the rest of the industry show up badly.

The first illustration (Figure I) shows soap containing two per cent of G-11, based on the total weight of the soap or 6 2/3 per cent based on anhydrous soap. This soap is diluted three to one or to a use dilution of ½ per cent of G-11 to 7½ per cent soap solids.

To obtain a true picture of what a germicidal soap will do, the tests on the first day are made with a surgical soap that does not contain G-11. The subject then proceeds to use the medicated soap at least three times each day. The second tests made on Wednesday were done at the end of a period during which the subject washed thoroughly at least six times with the medicated soap, and washed an uncounted number of times with other soaps. No washing was done with medicated soap for four hours prior to obtaining the cultures with the non-medicated soap. The third test shows the results of the consistent use of the medicated soap for four days and three times a day or twelve washes. These tests should be carried on for at least two weeks for a more accurate evaluation of a new formulation.

Single-Wash Test

ANOTHER method of testing that is employed by several sources is fairly well adapted for measuring the effectiveness of single washes of the germicide preparatory to surgery. Preparation for surgery has not, until the advent of G-11, depended upon continued scrubbing, repeated every day. Formerly, it depended upon a single scrubbing operation varying greatly in method and time consumed.

The "glove juice" test consists of obtaining a right and left hand count of the subject using non-medicated soap one day and taking a similar count the next day. The subject washes, rinses thoroughly with sterile water and puts on a pair of sterile rubber gloves. These are worn for two hours. The gloves are then removed by stripping—not reversing. One hundred cc's of sterile water are poured into the gloves and shaken. One cc is taken and plated. The results vary considerably, but a noticeable drop in count is typical as indicated in Table II.

In all these tests soap is present. Very little is present in the innoculated agar in this test. The Price method introduces much more soap in the agar. We know that soap represses the bacterial count. Hundreds of tests made using sterile saline, and ¼ per cent sterile soap solution in obtaining bacterial count from the hands have proved this. Soap is present in the control tests of both these methods, and therefore, it is not a factor.

THE use of germicidal agents in soap has been investigated over the years by many. Critical soap to germicide ratios have ruled out most germicidal soaps. G-11 was the first to tolerate a large ratio of soap to a small ratio of germicide. This is particularly desirable in bar soaps. Due to the uncertain supply and high cost of G-11, our laboratory, in conjunction with a leading hospital, made an extended investigation of "Santophen I," or chloro benzyl phenol, in liquid soap. "Santophen I"*** was selected because of its ability to tolerate larger

* Presented before the 36th mid-year meeting, Chemical Specialties Manufacturers Assn., Chicago, June 12, 1950.

** G-11 is the registered trade mark of Sidar Corp., New York.

*** Made by Monsanto Chemical Co., St. Louis.

Soaps

TABLE I
Wash Basin Tests.

Non-Medicated Soap 7½% Total Solids	*Basin*	*Monday*	*Wednesday*	*Friday*
Subject A	1	1,380,000	115,000	22,000
	2	845,000	221,000	14,000
	3	768,000	77,000	11,000
	4	576,000	53,000	11,000
Subject B	1	1,228,000	74,000	102,000
	2	1,388,000	85,000	51,600
	3	883,000	100,000	49,000
	4	1,002,000	97,000	52,000

ratios of soap to germicide than other compounds with which we are familiar. Its phenol coefficient against *E. Typhosa* and *Staph. Aureus* is as follows in varying proportions of soap.

TABLE III
40% Total Solids Coconut Oil Soap

	E. Typhi	*Staph. Aureus*
Santophen I 1%	.6	0
2%	2.8	1.0
3%	4.7	5.0
4%	6.5	8.0

Ratios of one part "Santophen I" to 15 parts of soap or less would seem to be effective germicides. Agar cup tests compared with "G-11" also indicate that it would be effective.

The plates below were made using a diluted soap containing five per cent coco soap and ½ per cent of "G-11" in plate No. 1, five per cent coco soap and ½ per cent of 'Santophen I" in plate No. 2.

Glove juice tests as previously described show a favorable reduction of bacterial count.

The use of "Santophen I" in soap has a low toxicity to the skin. In conjunction with Dr. P. J. Robechek of over 250 closely observed cases of use by hospital personnel in concentrations of from ¼ per cent to one per cent in the use dilution only three cases of irritation were observed. These were in one per cent solution by surgeons who washed very frequently each day. The irritation was influenced by the type of rubber glove used. No complaints occurred from use in the ½ and ¼ per cent concentrations. Thousands of washes have been made repeatedly by various types of personnel over a period of six months. It has been the only soap used in several operating rooms, in wash rooms for office and factory personnel for six months or more without ill effects. Concentrations of one per cent in coco soap caused no difficulty where frequent washes were made without the wearing of rubber gloves. The tests were conducted for over a year with the same personnel.

TABLE II

Unmedicated Soap 7½% Total Solids			*G-11 ½% Soap 7½%*
Subject	*Hand*	*Total Count*	
No. 1	R	100	*Av. Count 100* { *Subject uses only G-11 Soap at work and home.*
	L	100	0
No. 2	R	19,600	1,400
	L	23,300	4,000
No. 3	R	1,900	100
	L	9,700	200

These tests would indicate that "Santophen I" in a proper formulation is an effective degerming agent. There may be others. We believe that they will be revealed by *in vivo* testing and not by *in vitro* screening. We have not tested other chloro phenols at this time, nor have we run any tests in soda soaps.

Plates 1 and 2

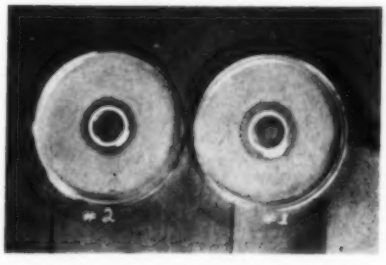


TABLE IV
Glove Juice Tests.

Subject	*5% Coco Soap Unmedicated*		*5% Coco Soap ½% Santophen I*
	Hand	*Total Count*	*Total Count*
A	R	18,900	1,350
	L	556,800	4,400
B	R	3,100	1,550
	L	19,600	1,100
C	R	29,500	7,600
	L	13,350	2,500

Wash basin tests as previously described also show favorable results.

FOAM measurment and analysis have always been important functions in the sanitary chemical field. Experimental work has indicated that the detergent action of aqueous cleaning solutions is due to their colloidal nature. Since foams are considered colloidal systems because the thickness of a soap film is of coloidal dimensions or because the films exhibit colloidal properties, it would seem justifiable to interrelate foaming power with detergency.

In recent years, however, it has become common practice to describe detergency in terms of degree of solubilization, ionic micelles, the action of mixed monolayers, or simply mechanical and solvent action. The emphasis has been more scientific in nature and lacking in sales appeal to the buyer of liquid cleaners in the sanitary chemical field. It is felt by many that better methods of foam analysis should be developed since the majority of purchasers in this field consider foaming of prime importance. Since there is a large volume of sales information written about foaming power, it is the purpose of this paper to describe how foam measurements may be compared and analyzed.

What Foam Is

IN ORDER to study the problem, it is first necessary to understand what foam is, and briefly, how it is created. Foam or froth may be defined as globular liquid films enclosing a vapor or gas. They may be considered as similar to emulsions in that absorption films surround the dispersed phase which in this case is the gas. Generally this phase is larger than the dispersed droplets in liquid emulsions.

Probably the most widely known theory for film formation is the balanced layer theory introduced by Edser (1) and extended by Foulk (2) (3) (4). The author of this paper neither defends nor criticizes the balanced layer theory but only presents it as a possible explanation for foam formation. It is stated in the literature that all true solutions will foam providing there is a definite increase or decrease of surface tension with concentration. Similarly, a sol or colloidal solution will foam provided that the colloidal particles concentrate in the interface, or are forced out of the interface.

Foulk considers that the liquid films surrounding the gas phase result when two already-formed surfaces approach each other on the liquid side. There is a mechanical force acting to bring the surfaces together and a resisting force, caused by the thin layer of liquid between the surfaces, creating an opposite effect. When the two forces counter-balance each other, the surface movement ceases. The source of the resisting force is the difference in concentration between the surface layer and the body of the solution, set up by either positive or negative absorption of the solute from the mass of the liquid. Thus, to get a foam on shaking a liquid with a gas, it is essential that there be a distinct surface film and that the concentration in this surface shall differ appreciably from the concentration in the body of the liquid.

It is also generally concluded in the literature that absolutely pure liquids will not foam, but the presence of minute quantities of a stabilizing agent can cause foam formation.

A soap bubble film is only a few thousand angstrom units thick and yet the different parts of the film are usually in continuous motion. In dilute solutions, it can be observed that small bubbles merge into larger ones on being crowded together. As we add solute of the surface active type, the bubbles formed remain small because of the resistance to mixing offered by the layers of solution constituting the interior surfaces of the bubbles. At a certain concentration, the bubbles will remain the size they issue from a tube or capillary of a soap bubbler. This is because the solute dissolved in the liquid causes a resistance to coalescence and causes the bubbles to roll past each other without merging. Hence the gradual decrease of bubble size shows film formation increases with concentration until a certain point is reached. Even though there has been a great deal of study of the soap film, there is no completely satisfactory theory to explain structure and stability. It is indeed puzzling to know that the soap bubble is so thin and fluid and yet is resistant to further decrease in wall thickness.

Two Methods of Measuring

THERE are two general classifications for foam measurements: the static method and the dynamic method (5). The static method usually consists of producing a foam and then studying its behavior with little importance attached to its method of generation. Perhaps the simplest static foam experiment would be to create mechanically a foam in a closed container and observe the rate at which drainage occurs and the life or stability of the formed bubble films. It can usually be shown that the rate of drainage of a liquid foam system obeys a set equation for a particular material. The dynamic method consists essentially of measurements taken during foam generation such as rate of formation or ultimate volume of formation. The absence of proven mathematical relations to express growth and decay of dynamically generated foams makes their analysis more complex and correlation more difficult.

In dynamic methods the emphasis is withdrawn from drainage and stability and is placed on rate of formation or the ultimate volume reached in a calibrated container. The foam is produced by the passage of gas through a liquid from a porous septum of some type. When the foam is not absolutely stable, the final volume is less than the volume of air in-

FOAM

troduced by an amount which is a measure of the instability of the foam, assuming that no bubble size change has occurred (6). From this it follows that capacity to foam and stability of foam are separate functions and must be evaluated individually. It is therefore postulated that during any foam measurement, there must be an emphasis on the particular factor in question. Since the dynamic foam meter is imparting breakdown stresses during its operation it creates in part a measure of stability or an inherent error to a strictly dynamic measurement.

MMEASUREMENT

By Joseph G. Sinsheimer
Fuld Bros., Inc.

Presented at 36th Mid-year Meeting C.S.M.A., Chicago, June 13, 1950

The breakdown stresses or destructive mechanism which cause decay may be cited as examples at this point. They are mechanical shock, thermal shock, and chemical change within the film surface as the most prominent examples. The belief of this author, as will be pointed out, is that a combined theory can be established so as to make foam measurements an inclusive consideration of the prime factors involved thus enabling comparisons between products.

Government Sudsing Test

THE original method of foam testting adopted at Fuld Bros., Inc., resulted from an adaptation of a sudsing test listed in Federal Specification P-S-536, section F-5u (1937). The test is listed as the "Solubility and Sudsing (lathering power) of Soft Soap." It reads as follows:

> "Treat 0.75 to 1.0 gram of the soap with 500 ml. of distilled water at 15.5° to 20° C., stir thoroughly, and note whether the soap dissolves readily. Place 20 ml. of this solution in a 100 ml. glass cylinder, stopper, shake the solution backwards and forwards 20 times, in 10 seconds, and let stand a few minutes."

It was felt that if the same conditions were repeated time after time in this test, reproducible results could be obtained. The modifications of this test at Fuld Bros., Inc. were to make the time 60 seconds or about 120 complete oscillations and to note the initial volume and the final volume of the foam for a time period of 15 minutes following the shaking. In previous years, this method had been used as one of the control tests for foam producing products. For example, in powdered soap products, the performance characteristics of this simple test were used as one of the requirements for uniform soap content even though it was determined analytically.

Later it was decided that too much of a human error existed in the hand shaking of a cylinder. We substituted a mechanical shaker which gave the same number of horizontal oscillations throughout a stroke length equal to the average traverse of movement of the human arm. It was found that for the same size cylinder and the same solutions, slightly smaller volumes of foam and of larger bubble size were produced in the mechanical shaker. To improve this, the entire shaker was changed from a stationary position to a small table on wheels with a heavy spring coil mounting for the apparatus. A certain degree of uninhibited motion was introduced by the shaking, as the table moved backwards and forwards about a half an inch with each complete stroke.

It was noted also that some materials gave foam which completely filled the twelve inch cylinder in use at the set concentration and must be considered as "underfoams." To overcome this, the use of longer cylinders was tried. It was observed that there was an increase in foam volume for strongly foaming materials as the tube size lengthened, but at a certain point the foam volume began to drop off. The use of a small shaped wire acted as a baffle within the tube and brought the mechanical action up to a point where it reached that of the shorter tubes in which the liquid bounced off of the ends of the cylinder with each stroke. Increasing the time of shaking also had a helpful effect, but this made the data more difficult to correlate.

Recently it came to our attention that a new simplified dynamic foam generator was being tried experimentally. The reference was obtained from a paper issued in 1949 as a part of the *Journal of Research* of the National Bureau of Standards (7). In the paper, there is mention of the preparation of a rather uniform bubbler head for use in measuring the rate of growth of foam under a standard bubbling rate. The bubbler was prepared as follows: A glass tube, ⅛ inch in diameter and 18 inches long was sealed at one end with 20 small pieces of copper wire (0.01 mm diameter) fused into it. When the end of the tube had cooled it was dipped into nitric acid, which dissolved the copper wire and left 20 fine holes of theoretical uniform diameter.

There is a detailed description of this method of preparation in an unpublished paper entitled "Preparation of the Bubbler Tube" by C. L. Gordon of the National Bureau of Standards. This paper gives a less exacting method of manufacture for the Branham-Sperling bubbler tip (8) for difficult absorptions along with an introduction to performance characteristics for the produced bubbler heads.

After the preparation of these bubbler heads, it was necessary to devise a simple system of maintaining a constant bubbling rate. Credit

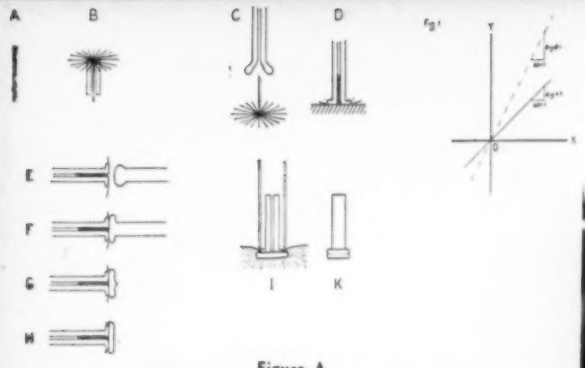
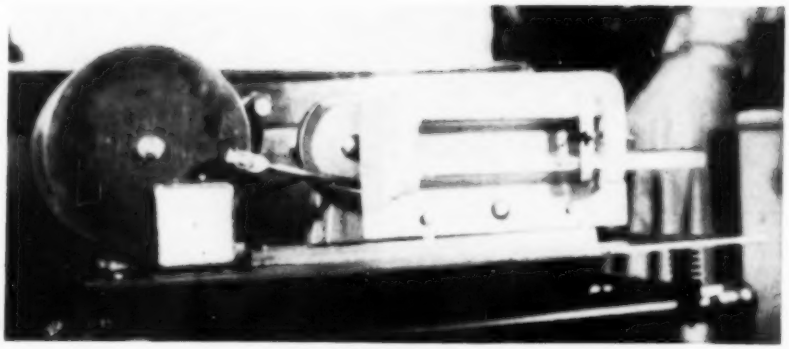


Figure A



Mechanical Shaker-Front View

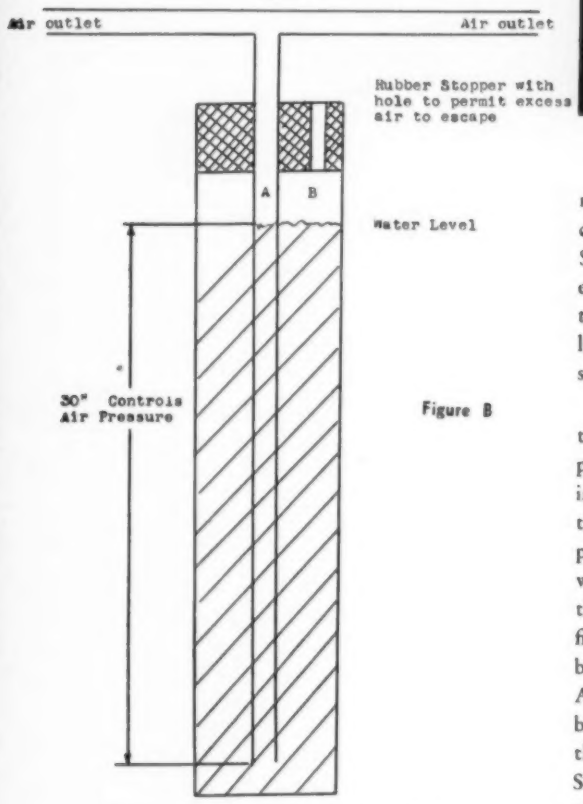
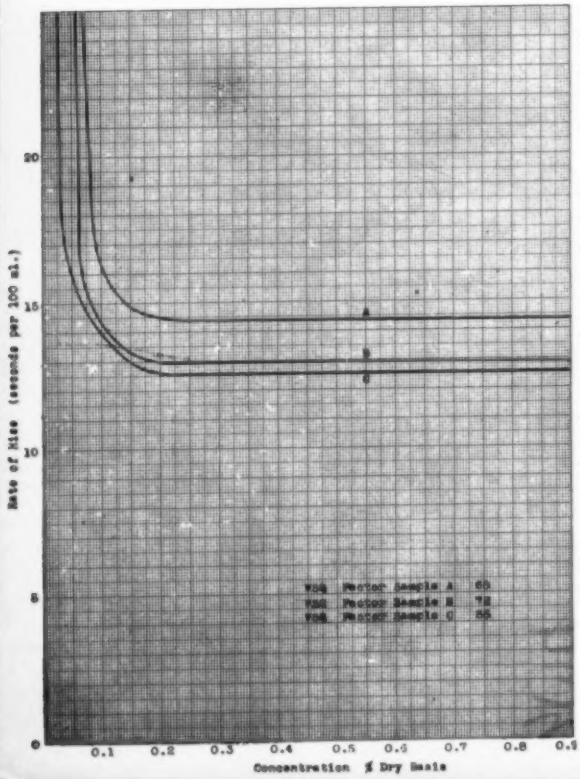


Figure B

Figure C. Calibration Curve—Aerosol OT Concentration vs. Rate of Rise.



must be given here to W. W. Walton, chemist at the National Bureau of Standards for his helpful correspondence and guidance in the solution of this problem. At his suggestion, our laboratory constructed a simple pressure regulator as shown in Figure B.

The pressure is determined by the distance between the bottom of the pressure tube A and the water level in B. This distance was 30 inches and the air pressure corresponded to the pressure produced by a column of water 30 inches high. The pressure of the air introduced must be merely sufficient to keep a slow stream of bubbles issuing from the bottom of tube A. It was made a point to keep the bubbling rate similar to that used in the work at the National Bureau of Standards so as to have some means of correlation of results.

Upon completion, the foam meter is as shown in the accompanying picture except for the air filter and carbon dioxide adsorption unit which exist at the air compressor side of the line and are not shown.

The measuring cylinder is a standard 1000 ml graduated cylinder, open at the top, with an inside diameter of approximately 60 mm. and a height of 350 mm. to the 1000 ml. mark. The cylinder contains 200 ml. of test solution. It was found that the rise of foam within the cylinder was not always perfectly even. As a result, the foam might reach the top mark in the center of the cylinder, while the volume building up along the sides of the cylinder might lag. The introduction of a small piece of stainless steel screening, attached to the bubbler tube at the 1000 ml. mark gave more uniform time readings at that point.

As the first step in the use of the foam meter, it was necessary to study the characteristics of several bubble heads under identical conditions to see if reproducible data could be obtained. It was observed immediately that at the same air pressure, and with the same solution, different rates of foam growth were recorded. Hence, it was necessary to find a suitable means of calibration for the tubes if the apparatus were to be used by different laboratories with any degree of standardization. All previous work at the National Bureau of Standards had been done with only one bubble tip, and all results were based on direct comparisons.

Standard Solution Needed

AN ESSENTIAL factor in the choice of a standard solution is that purity and uniformity be such that anyone obtaining a sample could produce the same results. Since the properties of soaps vary with so many factors, they were eliminated immediately from consideration. A solution of alkyl dimethyl benzyl ammonuim chloride was chosen and made into the proper concentration by analytical means. There was very little uniformity or repetition of results, due to the instability of the foam and the reaction of the material with the glass vessel (absorption of quaternaries with glass).

Next a sample of "Aerosol OT," which had been previously purified in our laboratory by ether extraction, was tried. This material worked to much better advantage, and more uniform results were obtained if the

variable experimental factors were controlled.

There could be no assurance that the diameter and shape of the capillary pores within the bubble head were the same, or that they would produce foams of the same consistency. However, it was always possible to place the exit holes of the bubbler in the same position with respect to the top surface of the solution.

Other factors which might influence the rate of flow from the bubbler tube are the density, viscosity, and surface tension of the solution. These factors are considered negligible with respect to the type of material used in the calibration and were considered of little effect in the pressure regulation of the air flow rate. Perhaps, instead of maintaining a constant pressure for our work (which resulted in different back pressures due to the variation of the bubbler heads) it would have been more desirable to use a flowmeter and then adjust the pressure of the various bubblers so that the same volume of gas per second would flow through each tube. If this method enabled one to obtain agreement in the results with different tubes, each tube could then be marked with the correct pressure for its use.

The diagrams marked as calibration curves of concentration vs. rate of formation (see Figures C and D) show an interesting story. The work was done with three bubbler heads and is plotted on linear and logarithmic papers. For Aerosol OT on a linear plot, when a standard bubbling rate is employed, there is no appreciable

Bubbler Apparatus

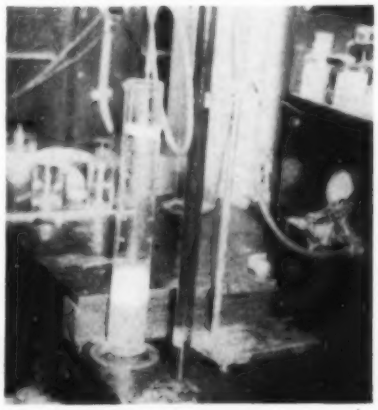


Figure D (top right): Log-log plot of concentration vs. rate of rise for Aerosol OT.

Figure E (center): Straight coconut soap concentration vs. rate of rise.

Figure F (bottom right): Comparison of three samples of liquid soaps.

change in the rate of growth of foam, with variations in the concentration above a critical region of about 0.15 per cent on a dry basis.

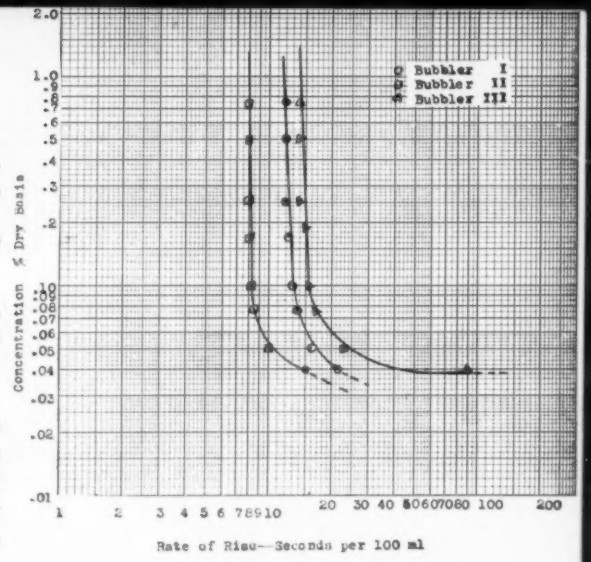
The work in our laboratory was done with solutions of concentration varying from 1.5 per cent down to 0.03 per cent. It was found that below concentrations of 0.03 per cent, the foam is relatively unstable and tends to break down almost as rapidly as it is formed. The accuracy of the dynamic foam meter becomes low as the time of rise increases towards a theoretical value of infinity. Thus, at low concentrations, reproducible results are unobtainable.

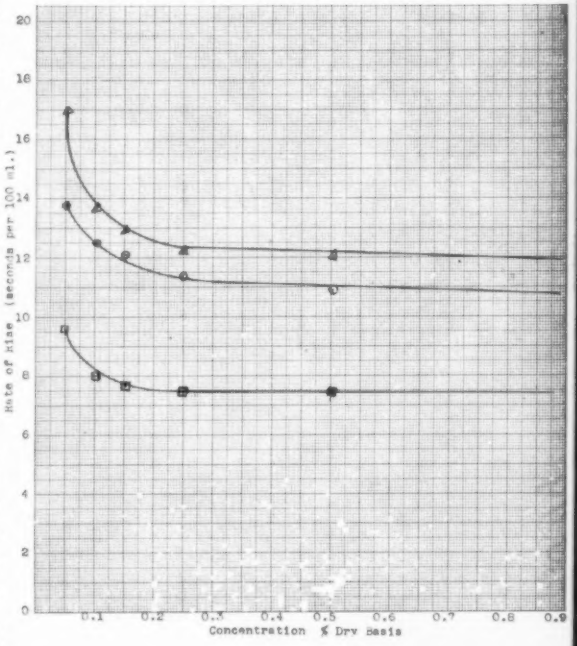
From the straight line portion of the calibration curve, a factor for each bubbler head may be calculated and used as a means of correlating data. The calibration work was done solely by measurement of rate of growth with no emphasis on the stability of the produced foam. Since it was observed that a majority of the foams produced at concentrations above the critical area were stable for long periods of time, the decision was made to eliminate this study as it would be time consuming and of little value as a rapid control test. It is felt, however, that this study would be of value and a future research project directed at low concentrations would be of merit. Since there may be an interrelation between capacity to foam and stability, future study might lead to positive results and a more related theory.

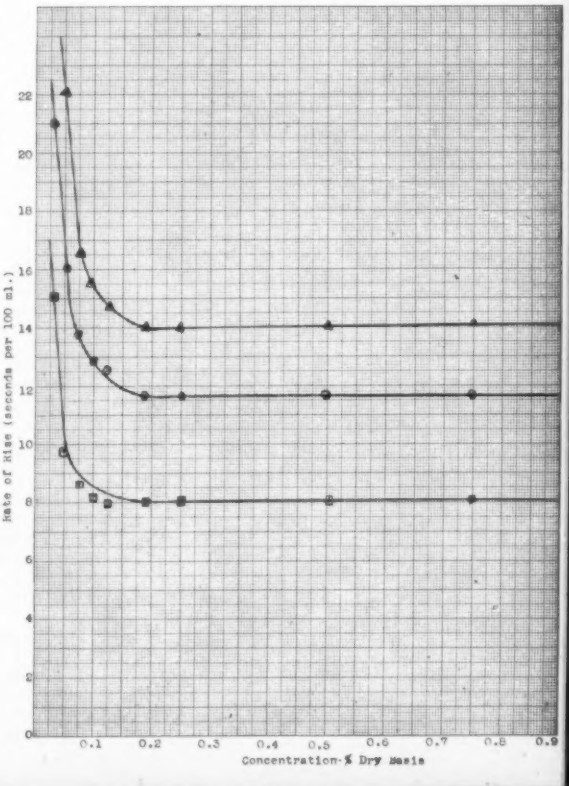
Work With Soaps

THE work in our laboratory was then directed towards liquid hand and scrub soaps after the attainment of a satisfactory calibration factor for each bubbler tube. The curves were of the same general nature as that of Aerosol OT and the correlation was obtainable between tubes (see Figure E). It is important to maintain the capillary pores clean and fully open

(*Turn to Page* 157)







WHAT'S NEW?

New Seaforth "Hook 'N Lather" soap set consists of two hard-milled cakes of soap, each with a hole in the center—and a chrome finish hook mounted on a rubber suction cup that attaches to any type of wall surface. Soap can be hung up to dry. Hook can be used also for holding wash cloth, bath brush or shower cap. $1.50 for the set.

A guest size crown of Prince Matchabelli's "Abano" soap is part of a novel gift set that includes four "Fieldcrest" guest towels. The set packaged in cellophane window wrapping retails for $2.00.

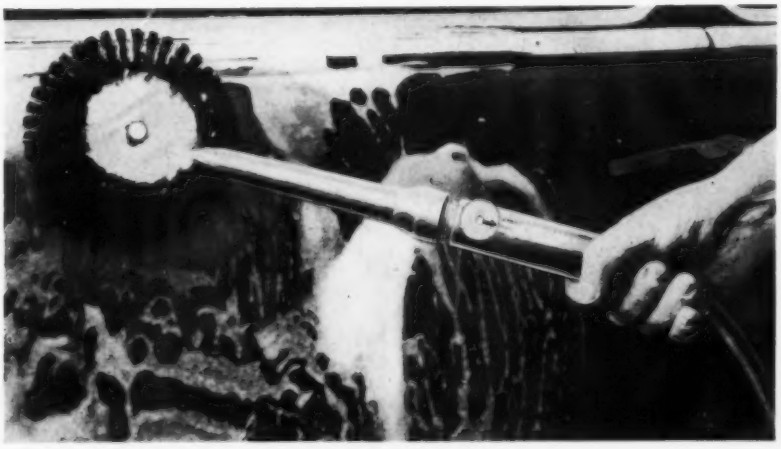
Net "Jet" atomizer cap replacement for sifter-tops for powders on metal and fibre cans and glass bottles and jars was announced recently by Container Specialty Co., Cleveland. A finger-tip squeeze sprays either up or down. Powder and air are mixed in a method similar to a carburetor. Product is now being used for containers of insecticides, etc. Plastic tubes and baffles, and metal or plastic closures are fitted to rubber bulbs and tips, colors to harmonize with labels.

New "Isotox" garden spray and liquid dairy spray insecticides that contain lindane are now being promoted for garden and dairy pest control by California Spray-Chemical Corp., Richmond, Calif. The insecticides come in four ounce and one pint sizes as shown at right. Duraglas bottles were supplied by Owens-Illinois Glass Co., Toledo: lithographed metal closures are by Crown Cork & Seal Co., Philadelphia.

New low price aerosol announced recently by Bridgeport Brass Co. retails for 79 cents. It is fair traded for sale through drug, grocery, hardware, variety and retail department stores.

Now available for the first time in new type twist-tube container is "Here's How" active ozone shave cream made by House of Gourielli, New York. Tube is finished in a white linen pattern with silver cap and base, which when turned forces cream out at top. Tube is specially lined to avoid cracking. Retail price of the 4 oz. unit: $1.25.

New deluxe version of the "Swirl-O-Matic" automobile brush featuring the three-way automatic valve that feeds detergent, rinses and shuts off water. A detergent tablet is placed in the valve through which water runs and is emitted at whirling brush head. Unit retails for $10.70 east of the Mississippi, slightly higher west of that river.



CMC IN SYNTHETIC DETERGENTS cuts cost—improves wash

Synthetic detergents work better and cost less to make with technical grade Hercules® CMC (sodium carboxymethylcellulose). CMC keeps dirt in suspension and prevents its redeposition. Further, use of CMC lowers materials cost by permitting the generous addition of alkaline builders. Very small quantities of "Hercules" CMC will accomplish these results. Let us work with you in adapting CMC to your needs. Both the technical and purified grades are available.

HERCULES POWDER COMPANY
961 Market St., Wilmington 99, Delaware

HERCULES

CM50-3

TRADE NEWS

AASGP Board to Meet

A meeting of the board of directors of the Association of American Soap & Glycerine Producers, Inc., is scheduled to be held in Chicago on Thursday, Sept. 28. Place of the meeting is to be announced shortly.

Fels Names Coyle, Brown

Edward B. Coyle, for the past 10 years in charge of production and plant operation, was recently elected vice-president of Fels & Co., Philadelphia, succeeding Cyril G. Fox, who was named president July 5. Mr. Coyle has been with the firm since 1908.

Max Brown, who was named general sales manager last year, has been elected a director. He joined the firm as a salesman 23 years ago in the mid-west, where he had been in the wholesale grocery business. Until his appointment as general sales manager, Mr. Brown was manager of the New York office and in charge of the eastern sales division for 15 years. Prior to that he was in charge of the Indiana-Michigan territory. During World War II he was a member and director of the Fats Salvage Committee.

During his years of service with Fels, Mr. Coyle planned and supervised the construction of most of the buildings of the present plant in Philadelphia, which covers 30 acres. He is a past president and director of the Philadelphia Purchasing Agents' Assn.

Heads Laundry Assn.

J. Stanley Hall, manager of the laundry and dry cleaning department of Pennsylvania Salt Manufacturing Co., Philadelphia, was elected president of the Laundry and Cleaners Allied Trades Association at its recent convention.

The national association has a membership of 500 representing manufacturers and distributors of supplies and equipment for the laundry and dry cleaning industry. Mr. Hall has been active in the organization for several years, having previously served

J. S. HALL

on its board of directors and as chairman of its exhibit program at national conventions.

Mr. Hall has been associated with Pennsalt for the past 18 years and with the laundry and dry cleaning department since its inception, first as assistant manager and then as manager.

Turco Buys Newark Site

Turco Products Co., Los Angeles, recently acquired an industrial plant consisting of 12 buildings and about three acres with frontage on the Passaic River and Lister Ave., in Newark, N. J. The site was purchased from Swan-Finch Oil Corp., which continues to occupy part of the plant as a tenant.

New Tennessee Soap

A new granulated soap product, to be marketed under the trade name of "Gran" was announced recently by Tennessee Soap Co., Memphis. Said to be the first granulated soap to be made by a southern manufacturer, Gran is made by the spray drying process.

Irvin G. Renner Killed

Irvin G. Renner, plant superintendent of Hewitt Soap Co., Dayton, O., was killed in an automobile accident on May 30. He had been associated with Hewitt for the past 27 years.

Britain Ends Soap Ration

Soap rationing in Great Britain will end September 10, it was announced recently to the House of Commons by Maurice Webb, Minister of Food. The last country this side of the iron curtain to do away with soap rationing, British soap supplies have been controlled for eight years. All types of soap were first rationed in February, 1942. The average weekly ration has been three ounces a person with a slightly higher allowance for children under two years. This is about half the amount used in Britain before the war, and about one-third the estimated average of soap consumption in the United States.

N. Y. Oil Trades Outing

The 34th annual summer sports outing of the Oil Trades Assn. of New York will be held at Pelham Country Club, Pelham Manor, N. Y., Tuesday, Aug. 22.

U.S.I. Detergent Plant

A new production unit for the manufacture of a lauryl sulfate detergent is nearing completion in Baltimore, and will be in operation in late summer, it was announced recently by U. S. Industrial Chemicals, Inc., New York. The liquid detergent, currently offered under the trade name "Sipon L-20," is the first surface active agent marketed by U.S.I. as the result of a broad detergent development program undertaken jointly by U.S.I. and Societe Sinnova of Paris, France. It is expected that additional surfactants will be offered in the near future.

Dr. Paul E. Burchfield (left) with Dr. Charles S. Johnson, whom he succeeds.

Wyandotte Ups Burchfield

Dr. Paul E. Burchfield was recently appointed director of technical service of Wyandotte Chemicals Corp., Michigan Alkali Division, it was announced recently by Bert Cremers, vice-president. He succeeds Charles S. Johnson, who has been director of technical service since 1939. Mr. Johnson is retiring from active service, but will serve Wyandotte Chemicals in an advisory capacity.

Dr. Burchfield formerly was assistant director of technical service. He joined Wyandotte Chemicals Corp. in 1943, having been connected previously with Harshaw Chemical Co. and United Gas Improvement Co.

Scientific Filter Moves

Scientific Filter Co. has moved recently to new quarters at 59 Rose St., New York 7, N. Y.

Norda Advertising Wins

Industrial magazine advertising of the Norda Essential Oil & Chemical Co., New York, was awarded first prize in the annual contest conducted by the National Industrial Advertisers Association for 1949 in the chemical and allied products class. Over 200 leading American industrial advertisers were entrants in the competition which is held yearly. The campaign which appeared in this publication and elsewhere was prepared and directed by the Fred Gardner Co., New York advertising agency. The award was presented by Blaine Wiley, secretary of NIAA, at a luncheon at the Advertising Club, New York, July 31. William H. Rowse accepted the award for Norda.

ACS Meets Sept. 4-8

The 118th national meeting of the American Chemical Society is to be held in Chicago, Sept. 4-8. Coincident with the convention the Sixth National Chemical Exposition, sponsored by the Chicago section of the ACS, will be held at the Coliseum.

Columbia, Union Sign

A three-year closed contract was signed recently by the Columbia Chemical Division of Pittsburgh Plate Glass Co., Pittsburgh, and Allied Chemical Workers, independent union, at the company's Barberton, O., plant. Principal products of the plant are soda ash, caustic soda, chlorine and related products. About 1,400 employees are covered by the new agreement. Earlier, Columbia signed a two-year contract with the A. F. of L. Chemical Workers at its Natrium, W. Va., plant.

A.M.A. Names Hancock

John M. Hancock, chairman of the board of Lever Brothers Co., New York, was recently elected chairman of the board of American Management Association.

FTC Soap Hearings

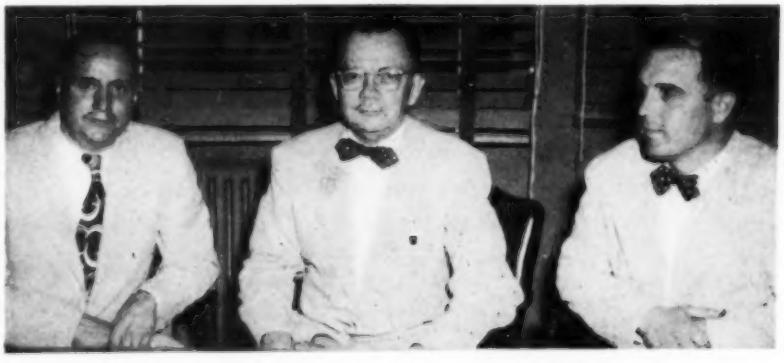
Argument on motions of three soap companies to strike out certain evidence and to dismiss the complaints of alleged price discrimination in the sale of soap products was heard before a trial examiner of the Federal Trade Commission in Washington, D. C., July 17, 18 and 19.

Further arguments will be presented when the hearings resume on August 14.

Charged with price discrimination by the Federal Trade Commission are Procter & Gamble Co., Cincinnati, Lever Brothers Co., New York, and Colgate-Palmolive-Peet Co., Jersey City, N. J. The Commission charges that the three soap companies grant rebates to certain customers and not others by charging new reduced prices for products previously purchased at higher prices.

The attorney for Procter & Gamble argued for striking out of certain evidence and dismissal of the complaint during the July hearings before Trial Examiner Randolph Preston.

Paul N. Sperry (left) and Arthur L. Dowling (right), who have been appointed recently as sales manager and advertising and sales promotion manager, respectively, with Charles O. Homan, vice-president in charge of sales for Dodge & Olcott, Inc., New York.



Target of 'Soap Monopoly' Declares Texas Soaper

EVER since he testified before the Gillette Committee in Washington some months ago, he and his company have been the "target for the soap monopoly," according to Ernest Gillam, president of the Gillam Soap Works of Fort Worth, Texas. In a letter, he takes *Soap & Sanitary Chemicals* to task for its previous criticism of him when he stated that "the three major soap companies were advertising the independents out of business." This was labeled in the June issue as a wholly irresponsible statement for which no proof has ever been offered.

Mr. Gillam's letter follows in full. Copies of it were sent by him to the Gillette Committee and to the Department of Justice, Washington, D. C.

"In almost every issue of your magazine since I testified before the Gillette Committee last summer, you have referred to my testimony. Each time with a little more sting in your criticism. In your June editorial you state "An independent soap manufacturer stated that the three major soap companies were advertising the independents out of business. This was put in the record by Ernest Gillam of Fort Worth, Texas, a contention which he had made also on previous occasions. We tab it a wholly irresponsible statement for which no proof has ever been offered. In fact, considerable evidence points to the exact contrary, etc., etc."

I regard your statement as hasty, uncalled for, insincere and untrue and ask you to publicly apologize for same, in as much as proof has been offered before different committees in Washington time and again and if your magazine were as responsible as the statements that I have made there would be a much better understanding in the soap industry.

The Department of Agriculture has records showing that during the war approximately 25 or 30 small soap manufacturers sprang up in the Southwest and to whom they issued quotas or price schedules to manufacture and sell soap. This was brought out in several open hearings of which you were well advised. I personally have bought equipment from at least half a dozen of these concerns who have gone out of business and can produce the records to show my purchases when it becomes necessary.

As for your statement "that an increase in sales in their areas during intensive advertising campaigns of some of the large manufacturers" is not only silly, but asinine and untrue and you know it. Your magazine contradicts your position when on page 31 of January 1949 issue, you state "—as best we can determine most of the medium soapers really took it on the chin last year."

If the balance of the Gillette Report is as sound as the statements that I made regarding the major soap companies advertising the independents out of business, then it needs not the dotting of an i or the crossing of a t to make it correct in every particular.

For your further enlightenment, and I am sending a copy of this letter to the Gillette Committee, ever since my testimony was given in Washington and Senator Gillette was kind enough to hold a special hearing for my testimony, I have been the target for the "soap monopoly" and their henchmen. There has scarcely been a breathing spell between the flooding of the City of Ft. Worth and surrounding territory with one soap coupon advertising stunt after another, 1 cent sales, two packages soap wrapped together and given away with other prizes at ridiculously low prices. My sales on my Ego Soap Powder in this particular territory has dropped off 40 per cent. Even the grocery stores will not carry ads on my Ego Soap Powder under these conditions. Week after week passes without any mention of it in their full page ads and I have standing by a $30,000 packaging unit, which I installed this last fall and a half million soap boxes that I have not touched because instead of my business continuing to grow as it was, these boys have taken in after me on my Ego Soap Powder and have actually blocked the sale to the extent that the new equipment is not needed. And were it not for the fact of my bulk business, in which I go direct to the laundries over several states, export business, etc., they would have me in a bad way.

They have followed me to the end of my export line and according to the report of one of my representatives outside of the United States regarding the big boys cutting prices "they are doing their utmost to eliminate us from the picture"; and during the interim there has been only a slight, or in most cases, no general decline on our home market on soap, except where my market has been established and, of course, I expect that this applies to many other independents.

I warned the Gillette Committee that this heavy expenditure in advertising annually by the three major soapers would be ruinous and, as you know, last year, the records show that the three spent $61 million in advertising alone, Proctor & Gamble spending half that amount and Lever Brothers and Colgate the other half, which is almost in exact proportion to their sales. Figure that one out. This $61 million was not intended to and did not help the small soapers regardless of your contention that it does.

Their prices are always the same, or nearly the same, so that there can be little choice and their price changes always come almost simultaneously.

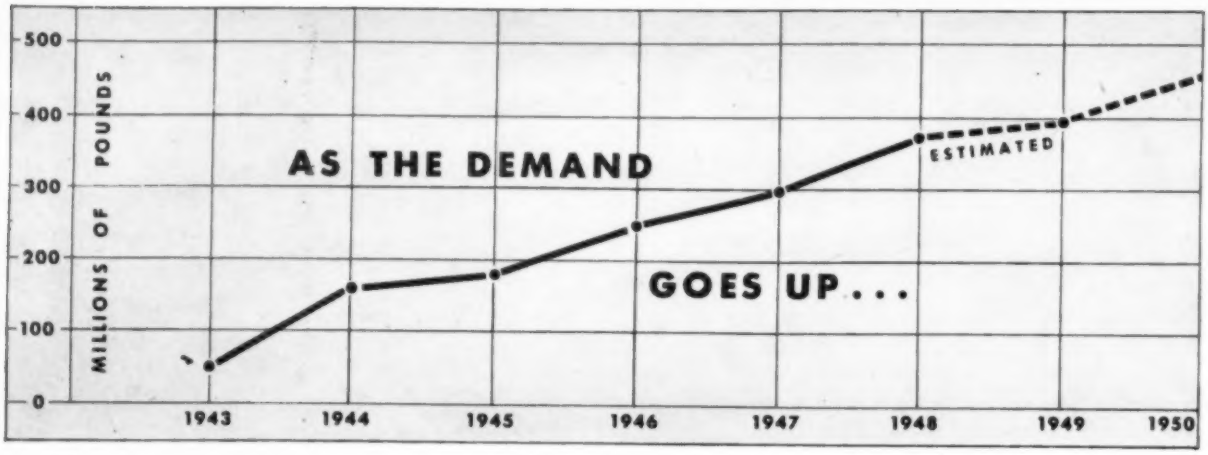
You might also be interested in that portion of my testimony before the Gillette Committee to the effect that these three concerns control the fats and oils market and if there were a small soap manufacturing concern in every city or town of 25,000 people or up to use up the surplus greases, etc., and to make honest bids on this merchandise, packing houses and renderers and the producers of animal and vegetable fats and oils would not be suffering these extremely low prices as at this time.

Also, my good friend, does it take very much explaining to you to make you understand who broke up the Independent Soapers Association? Think not, when Roy Peet was the principal speaker at the clandestine meeting which was the substitute for the independent meeting. These things are all well known in Washington and nothing you can say in your magazine is going to discredit me to the extent that they will not accept my testimony in the place, may I say, of a publisher, who would hate to see $61 million worth of advertising annually curbed even to the extent that it would not eliminate competition from the independent soapers.

The "Soap" Magazine is your magazine and you can publish what you please, but if you have the interests of the public at heart and the independent soap manufacturers in particular, you would do well to publish my statement in this letter, not that it would effect me in any way, since none of the things you have published about me have affected me financially one way or the other and you have been, up until the dissolution of the independent soapers, very understanding and fair. My only suggestion to you is not to run over into the camp of the "big boys" too quick, for we might whittle them down to our size and then you may have to make a new alignment.

Thanks, however, and I am enclosing you copy from the local papers, which confirms your statement that "I have a way of getting into the press." Frankly, it is a good paper that prints the news, I make it."

Editor's note: Although we do not feel that Mr. Gillam's letter is worth the space which it occupies, to obviate the inevitable complaint by him that we have refused to give him a hearing or an opportunity to answer our criticism, we publish the letter in full *exactly* as he wrote it. Our reaction to his letter is the same as that to his testimony before the Gillette Committee, that the statements mostly are irresponsible and without foundation in fact.



ANTARA® announces new low prices on NON-IONIC SURFACTANTS

Antarox A-200, A-201, A-400, A-401, A-402, A-403, A-404, A-480

Alkyl aryl polyoxy ethylene glycols

. . . in a complete series with varying properties and degrees of water-solubility—and from clear liquids to pastes and waxes

Steadily the demand increases—as industry after industry finds new and wider uses for surfactants. This young industry has already surpassed synthetic rubber in its tonnage!

The *non-ionic* surfactants are in particular demand by the makers of cleansers of every type—for the home, commerce and industry—insecticides, cosmetics, metal cleaning compounds, oils, waxes and other products.

In keeping with this trend, Antara announces new low prices—reductions of 13% to 15%—on the A-200 and A-400 Series of non-ionic surfactants. Such reductions mean that these superior agents are now priced for use by many additional compounders.

We invite your inquiry for Data Sheets and the new prices. Extensive research staffs and facilities support the development and application of all Antara Surfactants—available to work with you in the improvement of an existing product or the development of a new one. Your inquiry is invited—without obligation. It will bring a prompt opinion as to whether one of the Antara Surfactants may be adaptable to your needs. Kindly address your inquiry to Department 41.

APPLICATIONS

The excellent emulsifying, dispersing and detergent properties of these non-ionic surfactants—in hard or soft water—make them valuable base materials for liquid and powdered dish and glass washing compounds, car washes, dairy cleaners and sanitizers, laundry detergents, and all purpose household cleaners. Some members of the series are outstanding lime-scum dispersants when used with soap, and have shown promise when combined with organic sequestering agents, as clarifiers for liquid soaps.

ANTARA® PRODUCTS

SURFACTANTS . . . CARBONYL IRON POWDERS

GENERAL ANILINE & FILM CORPORATION

444 MADISON AVENUE, NEW YORK 22, NEW YORK

1639 POPLAR STREET, OAKLAND 7, CALIFORNIA

In Canada: CHEMICAL DEVELOPMENTS OF CANADA LIMITED, LEASIDE, TORONTO 17

"SOAP" 25 Years Ago

WITH this issue, *Soap & Sanitary Chemicals* completes 25 years of publication. "Soap," a monthly magazine for soapmakers, as it was described initially, appeared in Vol. I No. 1 in September, 1925. The front cover advertiser in this first issue was Ungerer & Co., with an advertisement on "Unco Sapodors." A tipped-in cellophane insert by du Pont Cellophane livened up the second cover. Other first issue advertisers included Solvay, Fritzsche Bros., Baird & McGuire, Welch, Holme & Clark, Mathieson Alkali, P. R. Dreyer, Chiris, Newman Tallow, Burton T. Bush, Philadelphia Quartz, Felton, Rohm & Haas, Van Dyk, Monsanto, Consolidated Products, Alsop Engineering, all incidentally still advertisers twenty-five years later.

* * *

The initial issue naturally carried the advertising of a number of firms which are no longer in business, or were taken over by others, like Rhodia Chemical, Morana, (later van Ameringen-Haebler), Imperial Export, Superfos, Roessler & Hasslacher, Klipstein, Wangler-Budd, Pierre Lemoine and others. It strikes a nostalgic note to read the copy of these firms, many of them long since out of business or superseded by other companies. By and large though, the advertisers represented in our first issue are still with us today, that is if they are still in business.

* * *

The first feature article in that September, 1925, issue was an opus by Charlie Bacon, the well-known oil consultant, on "The Crushing and Refining of Cocoanut Oil." Dr. Joseph Felton wrote on the new market for bath salts, a product which was just coming rapidly to the fore. Reporting on the 1923 soap census we commented that soap production had doubled since 1914. The totals, $276,000,000 for 1923 as against $127,000,000 for 1914. E. T. Drake of Houchin-Aiken Co., predecessor company to Houchin Machinery, wrote on "The Newer Trend to Reduce Soap-Making Operations."

* * *

Turning to our news pages, we reported that for the fiscal year ended June 30, 1925, sales of P&G were $156,000,000, a 30 per cent gain over 1924. . . . Bill Adkins had just been named purchasing agent for Burton T. Bush, Inc. . . . Baird & McGuire were building an additional manufacturing plant in St. Louis. . . . Fred Hoyt of Frederick Disinfectant Co., Atlanta, was president of the Insecticide & Disinfectant Manufacturers Association, predecessor to the Chemical Specialties Manufacturers Association. . . .The association was twelve years old in 1925.

* * *

Dr. J. K. Haywood was then chairman of the Insecticide & Fungicide Board of the U. S. Department of Agriculture. . . . Ben Newman had just announced a change in name of his company from United Sanitary Products Co. to the Creco Company and the firm had moved to its new building in Long Island City. . . . Tallow and cocoanut oil were both selling at 9½ cents a pound.

* * *

Dr. E. G. Thomssen, chief chemist of J. R. Watkins Co., Winona, Minn., announced that the company's new plant in Newark, N. J. soon would start operations. . . . There was still a Palmolive Company. . . . The I. & D. M. A. had just adopted a Code of Ethics. . . . Harry W. Cole of Baird & McGuire was secretary.

* * *

We ran a picture of Karl Dolge, president of the C. B. Dolge Co., astride his prize-winning hunter. . . . Puritan Chemical Co. occupied its own building in Atlanta. . . . Glycerin was being introduced strongly for automobile radiator anti-freeze use. . . . And remember the screams from the unsuspecting motorists who used glycerin the first time without adequate attention to tightening the cooling system?

* * *

Albany Soap Co. was planning a new plant at Rensselaer, N. Y. The late Joseph Grober was president of the firm. . . . W. Phillips was in charge of perfuming of toilet soaps for Lever Bros. at Cambridge. . . . Ralph C. ("Yip") Jennings, sales manager of N.Y.Q., had just gone to Chicago as mid-western representative for B. M. Spencer & Co., N. Y. Q. and J. L. Hopkins. . . . Charlie Kelly was general sales manager for Rhodia. . . . Prohibition was with us and industrial alcohol consumers were having their troubles. Remember the theatre spray business? . . . The Tenth Chemical Exposition was scheduled to get under way. . . . And the banks were predicting better business. How right, they were for four years until the bubble burst in 1929!

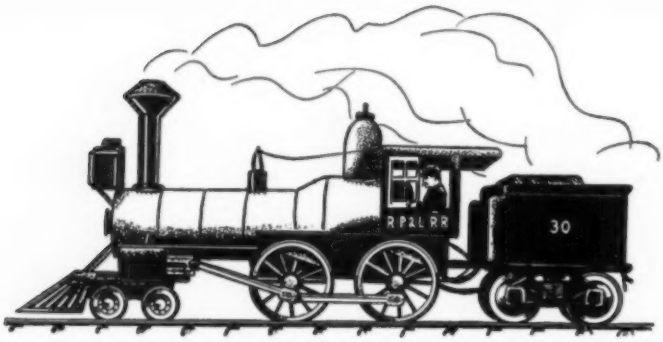
Incorporates to Make Soap

All-In-One, 720 Reibold Building, Dayton, O., was incorporated recently to engage in soap and detergent production, with authority to issue 250 shares of stock. The principals are Robert J. Roecklein, Edith Banker and J. D. Chamberlain, Jr.

Antara Prices Cut

A reduction of from 13 to 15 per cent in the prices of its non-ionic surfactants was announced recently by Antara Products, General Aniline & Film Corp., New York.

Antara's surfactants in the non-ionic class are glycols and glycol esters of the polyoxy-ethylene series, both alkyl and alkylaryl. They range from light clear liquids through pastes to waxes. All are included in the price cut.



Since the Days of the "Iron Horse"...

CHECK YOUR NEEDS FROM THIS LIST

VEGETABLE OILS

Babassu
Castor
Cocoanut
Corn
Cottonseed
Olive
Palm
Peanut
Sesame
Soybean

ANIMAL FATS

Sperm Oil
Oleo Stearine
Lard Oil
Neatsfoot Oil
Grease
Tallow
Lanolin

FATTY ACIDS

Red Oil
Tall Oil
Stearic Acid
Hydrogenated Fatty Acid
Cottonseed and Soybean Fatty Acids
Tallow

ALKALIES

Caustic Soda, Solid, Liquid, and Flake
Soda Ash, Light and Dense
Carbonate of Potash, calcined and hydrated
Calcium Chloride
Tri Sodium Phosphate
Tetra Pyro Phosphate
Quadrafos Granular and Beads—a stable polyphosphate for water conditioning and mild but effective detergency.

Soapers have depended on WH&C ...for Raw Materials of Quality

SINCE 1838, we've been supplying the nation's "soapers" with basic raw materials

SILICATE OF SODA—Liquid powdered and solid.

META SILICATE—"Metso"* Granular, "Metso"* Detergents—99, 22, 55, 66.

MAYPONS—Unique surface active agents; prolific foam; high detergency and emulsifying powders; suitable for cosmetic and industrial use.

AIR DRYETTES • CHLOROPHYLL

** Reg. U. S. Pat. Off., Phila. Quartz Co.*

Let us mix your dry private formulas

Established 1838

Welch, Holme & Clark Co., Inc.

439 WEST STREET NEW YORK 14, N. Y.

Warehouses in New York and Newark, N. J.

Cuts Detergent Prices

Price reductions of three to five cents a pound on four of its nonionic surface active agents were announced recently by Monsanto Chemical Co., St. Louis. Surfactants affected are "Sterox SE" and "SK," both 100 per cent active, now selling for 31 cents a pound in tank car quantities. "Sterox No. 5" and "No. 6," 85 per cent active, have been reduced to 27 cents a pound. Corresponding decreases on smaller lots also were announced.

Predict Soapless Washing

Laundering without soap was predicted recently by C. A. Stokes of Godfrey L. Cabot, Inc., Boston, and Professor J. E. Vivian of Massachusetts Institute of Technology at a recent discussion of ultrasonics at the Boston regional meeting of the American Institute of Chemical Engineers.

New Lever Margarine

Lever Brothers Co., New York, announced recently the completion of a new margarine manufacturing plant at Hammond, Ind., for the production of a new yellow "Good Luck" margarine, by its Good Luck Products Division.

Switches to "Ivory"

The use of "Ivory" soap, made by Procter & Gamble Co., Cincinnati, by Excelsior Laundry, Ardmore, Okla., was announced in a recent newspaper advertisement, headed "Announcing Something Extra Special in Laundry Service." The advertisement went on to state: "For your greater satisfaction—we now wash everything with 'Ivory' soap."

du Pont Shifts Tombak

George J. Tombak, since 1934 a technical salesman in the New York office of the Fine Chemicals Division of E. I. du Pont de Nemours & Co., Wilmington, was recently transferred to Wilmington as a technical adviser and customer consultant.

Mr. Tombak is a 1924 graduate of Columbia University, and has been in the aromatics industry for over 25 years. Prior to joining du Pont he was a practicing perfumer. He is president of the American Society of Perfumers and chairman of the Aro-

GEORGE J. TOMBAK

matic Chemical Committee of the Essential Oil Association. He is a director of E. O. A.

Mr. Tombak spoke on July 10 before the Rotary Club of Palmyra, Penna., on the "Growing Importance of Odor in Industry."

Dial Soap Price Cut

The price of "Dial" deodorant soap made by Armour & Co., Chicago, was reduced recently from 25 cents a bar to 19 cents or two for 37 cents. The first of the 25-cent deodorant soaps containing "G-11" or hexachlorophenol, on which the price has been cut, "Dial" is the only one of four leading deodorant soaps distributed through chain and independent food stores as well as through drug stores and toiletry departments of department stores.

Mich. Assn. Golf Host

The Chemical and Allied Industries Association of Michigan was host to members of the Chicago, St. Louis, Cleveland and Cincinnati Association, Tuesday, July 25, at the Birmingham Country Club. The occasion was the annual competition between the Chicago, St. Louis and Detroit groups for the Fort Dearborn golf trophy. During the day, a card party was conducted by the women, and the affair terminated with a dinner dance in the evening. A cocktail party at the Hotel Statler was held July 24, the night before the outing.

New "D-Flox" Detergent

"D-Flox," a combination soap and synthetic detergent that is said to contain water softeners and be soluble in cold water, was announced recently by Essential Chemicals, Inc., Milwaukee. The new cleaner is to be distributed through sanitary supply houses. Available in both sudsing and non-sudsing formulations, "D-Flox" is recommended for use in hard water. It is claimed to eliminate builders, bleach and bluing, and because of free-rinsing properties, sours ordinarily are not needed.

Little Fund Chairman

E. H. Little, president of Colgate-Palmolive-Peet Co., Jersey City, N. J., recently served as honorary chairman of the Jersey City Community Fund. Aloysius B. Whalen, president, Employes Association, Inc., Colgate-Palmolive-Peet Co., was elected to the board of directors of the fund.

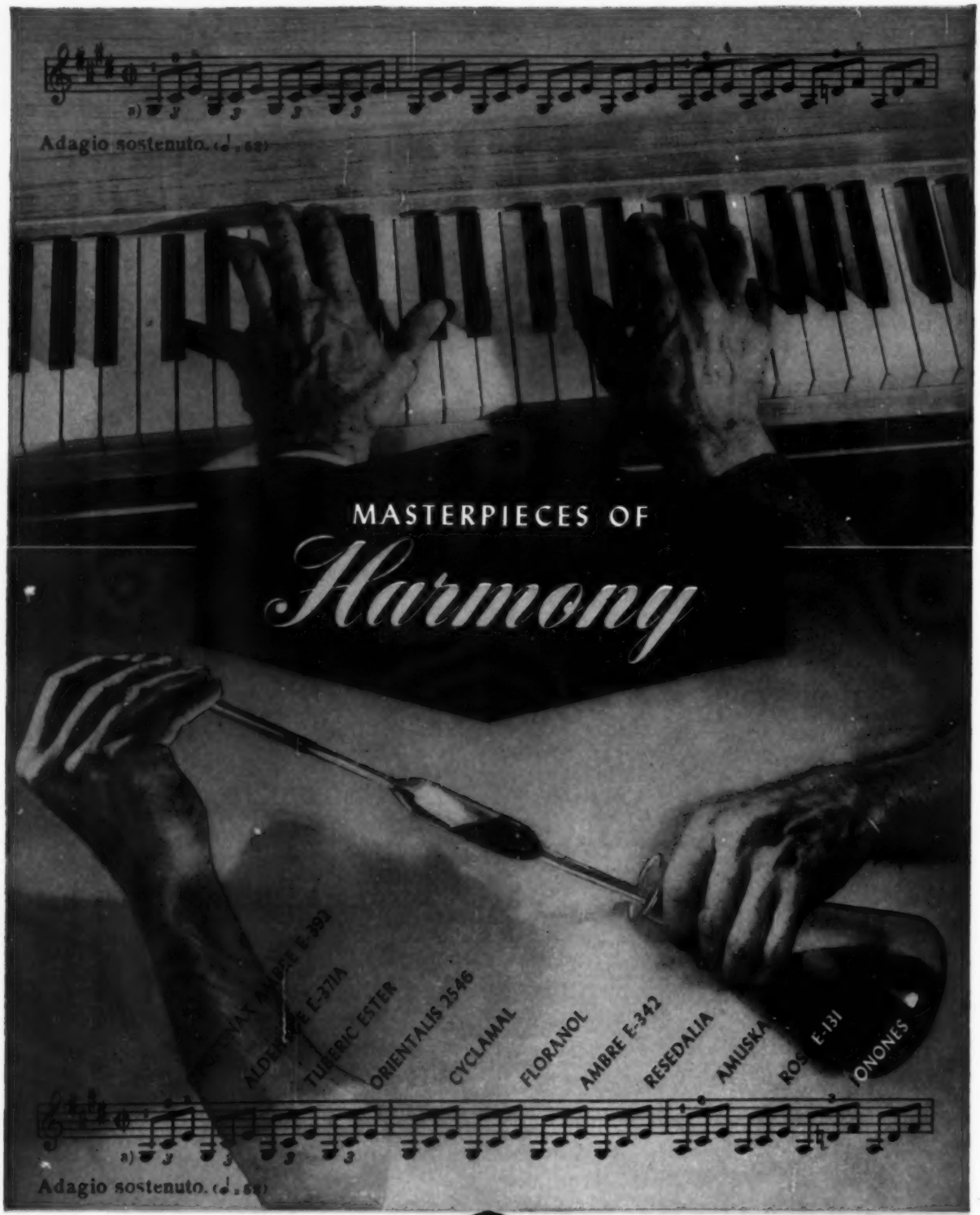
Chi. Cos. Chemists Meet

W. E. Lieb of Allen B. Wrisley Co., Chicago, presented a resume of the papers read before the meetings of the Society of Cosmetic Chemists and the Scientific Section of the Toilet Goods Association at a recent meeting of the Chicago Chapter held at Henrici's restaurant in the Merchandise Mart.

Carl F. Jensen, district engineer for Westinghouse Electric Corp., guest speaker of the evening, discussed the need for better lighting sources as a means of standardization of colors, based on the spectra point of view.

New Filtrol Headquarters

As part of its expansion program, Filtrol Corp., Los Angeles, recently established its new national headquarters at 727 W. 7th Street, Los Angeles. During 1949, according to Stanard R. Funston, Filtrol sales manager, the company had its greatest volume of sales, and added that the sales outlook for 1950 is brighter than at any time in the firm's history. For this reason enlarging headquarter facilities was necessary.



A lilting tune, a delightful fragrance... each depends on the harmony of its *notes*. The purity and fineness of Verona aromatic chemicals will help you achieve harmony in your products and add a fresh *note* of distinction to them.

VERONA

AROMATICS DIVISION

VERONA CHEMICAL COMPANY

26 VERONA AVENUE
NEWARK, N. J.

Lever Moves in Chi.

Lever Bros. Co. last month transferred their Chicago soap sales headquarters from 105 W. Adams Street to the 21st floor of the Board of Trade Building, at 141 W. Jackson Blvd., as another step in an effort to consolidate its Chicago district and central region executive activities in one place. Other Chicago offices which were shifted earlier to the Board of Trade Building at the foot of Lasalle Street include the buying office for fats and oils; bulk edible sales offices; and the local Pepsodent division sales offices.

Chiris Merges Distribution

F. E. Shoninger, president of Antoine Chiris, New York, recently announced that Stuart Brothers Co., Montreal, and the Chiris organization have joined in a distribution arrangement for Antoine Chiris products in Canada with Stuart Brothers Co. becoming selling agents for the New York perfume and essential oil house.

Stuart Brothers Co., founded in 1870, is one of the oldest flavoring and essential oil manufacturers in Canada. In addition to Montreal, they maintain offices in Toronto, Winnipeg and Vancouver.

Safety Awards to Soapers

The soap division of Armour & Co., and Swift & Co., were among 83 Chicago firms which received awards from the Greater Chicago Safety Council for records made in the safe operation of their motor truck fleets. Presentation was made at a banquet during the 27th annual Midwest Safety Conference in Chicago recently. Another winner of a safety award was Victor Chemical Works, for its outstanding record in an industrial accident prevention contest conducted among employees at the Chicago Heights plant.

Fire at Lavo Plant

A fire of undetermined origin in a two-and one-half story wooden shed behind the Lavo Company of America plant in Milwaukee recently caused damage of approximately $1,000. The company uses the shed for storage of old cartons, paper and cans.

Tapex Facilitates Taping

A new pressure-sensitive tape "Tapex," recently introduced by Tapematic Corp. of Newark, N. J., eliminates pre-cutting and can be operated with one hand, freeing the other hand to hold the item being taped. Its ease of operation is said to allow the user to tape quickly without small pieces of tap adhering to the hands. The tape is applied so that it is impossible to remove the tape without tearing or obliterating the paper under it.

Board Reelects Bartlett

E. R. Bartlett, president of Hooker Electrochemical Co., Niagara Falls, N. Y., was reelected to the board of the National Industrial Conference Board for a term of one year at the 34th annual meeting, held in New York, recently.

Heads Premium Assn.

John Davidson, premium manager of Colgate-Palmolive-Peet Co., Jersey City, N. J., was recently reelected for his fourth successive term as president of the Premium Association of America.

Packages Seen as Sales Tools

PURCHASERS may be made in the store, but customers are made at home, declared O. M. Gale, associate manager of the public relations division of Procter & Gamble Co., Cincinnati, in a talk at the American Management Association's packaging show in Chicago, recently. The package, said Mr. Gale, in a conference which considered "How to Increase Package Effectiveness," can be a very effective tool for making sales in the store, but repeat sales are often lost because manufacturers fail to consider the customer's possible reactions when the product is put to use in the home.

"There may be excellent reasons why a particular liquid should be packed in tall bottles," said Mr. Gale. "But just let that bottle tip over once or twice on milady's kitchen sink or dressing table and she is lost as a customer forever. Make it hard for her to get the last dozen tablespoonsful out of your mayonnaise jar and, however attractive the shape, maybe you'll find her buying the brand of a more thoughtful manufacturer next time."

Gale related how the maker of a new olive oil shampoo designed a beautiful bottle, that tied into the sales theme of the advertising, which was "fine merchandise." "There was only one trouble," he said. "The bottle was 8½ inches high and space between shelves in most medicine cabinets is not that high. So customer after customer decided not to repeat their purchases, because they couldn't stow the bottle in the bathroom. The lost ground was recovered, however, when the bottle was redesigned, with serrated sides, bowed inward, so that it could be gripped tightly, even with wet hands, and, of course, of a height that would permit storage in medicine cabinets."

"Another phase of the problem," Mr. Gale continued, "involves instructions for use. It is really surprising how many packages can be found that are liberally covered with display devices and selling messages, but which make no attempt whatever to tell the consumer how to use the product to the best advantage."

He told of his own experience in shopping for a garden insecticide. One product he examined had on its label the directions "Use 2 oz. to the gallons of water," while another said "Use 4 tablespoonsful to the gallon."

"I bought the one that told me to measure in tablespoonsful," he said. "How in the world do I measure an ounce? Maybe I guess wrong and kill my roses. If I do, the sales promotion has misfired."

"All of these considerations and many others," he concluded, "add up to the point that unless the package makes a real contribution toward convenience of use and toward delivery of satisfied customers, it is not doing all it can do to promote the sale of the product. Purchasers are made in the store; a customer is made in the home."

SOAPMAKERS....

DON'T FAIL TO EXAMINE

GERANIUM SYNTHETIC No. 17835

DIMINISHING stocks and the fast-mounting prices of natural oils merely emphasize the incredible value of this fully-proven, low-cost geranium oil substitute. Priced far below the genuine (at this writing it costs barely one-sixth as much) GERANIUM SYNTHETIC No. 17835 makes possible tremendous savings in the manufacturer's perfume material costs. Continuing repeat orders confirm the fact that this fine product is doing an exceptional job of duplication, matching closely the basic characteristics of the natural oil and at a cost, so attractive, that no perfumer can afford to ignore its advantages, either as a full or partial replacement for the natural oil.

Expert evaluation of the odor of GERANIUM SYNTHETIC No. 17835 places it between that of the best Algerian and Bourbon varieties. A sample for examination will be sent to any manufacturer who writes us that he's interested.

FRITZSCHE *Established* 1871
Brothers, Inc.

PORT AUTHORITY BUILDING, 76 NINTH AVENUE, NEW YORK 11, N. Y.

BRANCH OFFICES *and* °STOCKS: *Atlanta, Georgia, Boston, Massachusetts, °Chicago, Illinois, Cincinnati, Ohio, Cleveland, Ohio, °Los Angeles, California, Philadelphia, Pennsylvania, San Francisco, California, °St. Louis, Missouri, °Toronto, Canada and °Mexico, D. F.* FACTORY: *Clifton, N. J.*

RAW MATERIAL MARKETS

As of July 31, 1950

IN contrast to the slight price increases of fats and oils recorded here in the first few days after the outbreak of hostilities in Korea, stiffer price advances all along the line have been made in the past few weeks.

Besides higher prices for almost all of their raw materials, soap makers were faced with further bad news in the form of another cut in the supply of alkalies with the outbreak of a strike at the Diamond Alkali plant at Painesville, O. The Diamond walkout reduces the available supply of alkalies by another 20 per cent, which when added to the curtailment brought about by the Solvay shutdown, means a total reduction of over 60 per cent. Some progress toward a settlement of the Solvay strike, which began June 12, affecting plants in Syracuse, Detroit and Baton Rouge, La., was indicated July 30, when one agreement, said to be the first in the talks, had been reached. Resumption of negotiations was set for Aug. 3.

The government's decision to expand production of synthetic rubber is going to mean a further scarcity of benzene, which will affect production not only of synthetic detergents, but DDT and other types of insecticides and weed killers. Although some benzene of foreign origin is available, a price differential of about eight cents a pound is the main drawback to its wider use in the U. S.

Both synthetic glycerine and the natural product were advanced during the past week. The synthetic item now is quoted at 27½ cents in tank cars, f.o.b., Texas, which represents an advance of four and one-half cents a pound. Refined natural glycerine was advanced five cents to around 29¾ cents a pound in carlots.

In addition to a wholesale price increase of seven per cent on household soaps and shortenings, announced within the past two days by Procter & Gamble Co., Cincinnati, prices on industrial soaps have been increased, with 88 per cent tallow chip now reported at 12½ cents in carload lots. That represents an increase of one cent from the previous price. Quotas have been established on industrial soap sales by leading manufacturers, according to reports.

Higher prices on fatty acids are being quoted in line with increases on fats and oils. Tallow is currently selling for eight and one-half cents a pound for the fancy grade, as against 5⅛ cents earlier in the month. Reminiscent of the war and post war days, tallow jumped a cent and a quarter in a single day late in July.

Coconut oil moved higher going to 15¾ cents a pound, crude basis, Pacific Coast. The current price represents an increase of two cents a pound, as compared with the early July price. Copra, too, is up and is now listed at $210 a ton, Pacific Coast. That is a $30 a ton advance in approximately four weeks.

The crude vegetable oils were also caught in the upward movement of prices. Cottonseed moved from 13⅝ cents to its current listing of 17½ cents a pound; Soybean oil at 14 cents is up 2¼ cents; Peanut oil gaining 5⅛ cents is now 20 cents; and corn oil, currently quoted at 17 cents a pound, is up from an earlier July price of 14 cents.

A continued large production of inedible tallow, probably through 1951 at least, was predicted recently by the U. S. Department of Agriculture through its publication, *Fats and Oils Situation*. The forecast is based on the fact that the 1950 spring and fall pig crops probably will total about 99 million head, a four per cent increase over 1949 and the most since 1943. Cattle slaughter is also likely to show a rising trend because the number of cattle on farms has been increasing since 1948. Tallow exports in 1949 amounted to 427 million pounds, by far the largest in history.

A reduction in exports of copra and coconut oil from major producing areas: the Philippines, Indonesia, Ceylon and Malaya, is expected during 1950, as compared with the previous year, according to recent estimates of the Office of Foreign Agricultural Relations of the U. S. Department of Agriculture. Shipments from the Philippine Republic are expected to be larger. Exports from the four areas during the first quarter of 1950 amounted to 215,690 long tons, an increase of 18 per cent over the comparable period in 1949. The Philippines and Malaya showed increases of seven and 50 per cent respectively, and Indonesia and Ceylon showed decreases of 36 and 69 per cent, respectively.

The wax market in the face of strong demand has moved higher pricewise. Candellila is up approximately 11 cents to a 57-58 cents range. Carnauba has advanced to $1.09-$1.12 on No. 1 yellow, for an increase of about four to five cents. Ouricury has moved up to 72 cents, as compared with a previous price of 70 cents.

Gum and liquid shellac prices have gone higher recently. Bleached bone dry gum shellac now is quoted at 50 cents, a two cent advance over the previous price.

Essential oils for the most part have remained steady, one exception being orange oil, which has been advanced 25 cents a pound to $1.25. A short supply of the oil is expected for the next 10 months, with the major supply coming from California. Florida orange oil production will be reduced by the introduction of a new crushing machine that operates in such a manner that the skin is no longer an economical source for Oil Orange.

PINE OIL

SMELLS CLEAN...CLEANS CLEAN

More and more housewives prefer pine oil soaps for laundering, as well as for general household cleansing jobs. They associate the fragrant odor of pine oil with cleanliness—and naturally so! Pine oil not only smells clean, it's still unsurpassed for quickly penetrating and removing grime and grease.

Hercules® Pine Oils mix easily with other soap ingredients, do not stain, are safe to handle, and low in cost. It will pay you to re-evaluate the economy and sales appeal of these natural aromatic detergents.

HERCULES POWDER COMPANY
INCORPORATED
961 Market St., Wilmington, Delaware

NC50-4

BIDS AND AWARDS

Panama Canal Award

The award on 10,000 pounds of rust preventive in a recent opening for miscellaneous supplies by the Panama Canal purchasing office, Washington, D. C., went to Crystal Soap & Chemical Co., Philadelphia, with a bid of $780.

N. Y. Navy Grit Soap Bids

Bids on an unspecified quantity of grit soap were received from the following in a recent opening for miscellaneous supplies by the New York Navy Purchasing Office, New York: Pioneer Soap Co., San Francisco, item d, 6.5 cents; Day and Frick, Philadelphia, item a, 5.85 cents, b, 5.35 cents, c, 6.45 cents and d, 5.39 cents. Newell Gutradt Co., San Francisco, item c, 6.19 cents; d, 5.39 cents. Hunnewell Soap Co., Cincinnati, item b, 4.9 cents. M. Schneider & Sons Co., Brooklyn, item a, 5.86 cents; b, 5.52 cents; c, 10.52 cents; d, 9.68 cents. Kamen Soap Products Co., New York, items a and b, seven cents; c and d, eight cents; Murro Chemical Co., Burnsville, N. C., item a, nine cents; b, six cents; d, nine cents, bids on destinations a and b must be awarded together or not at all.

Supply Service Awards

The award on an unspecified quantity of sweeping compound in a recent opening for miscellaneous supplies by the Federal Supply Service, Washington, D. C., went to M. J. Gensberg & Son, Washington, D. C. The Gensberg bid was two cents.

In another opening of the same agency for scouring powder compound, Imperial Products Co., Philadelphia, received the award with a bid of 2.47 cents.

Awards on soap from an earlier opening were listed as follows by the Federal Supply Service:

Colgate - Palmolive - Peet Co., Jersey City, item 51-S-1430, 7.48c; 1655, 6.21c FtW, 6.39 c Den. Armour & Co., Chicago, item 51-S-1655, 5.09c DC. Procter & Gamble Dist. Co., Cincinnati, item 51-S-1430, 7.41c SF, 6.98c LA. Stahl Soap Co., Long Island City, N. Y., item 51-S-1430, 7.38c DC; 1885, 9.63c NY, 9.19c DC, 12.7c FtW; 1920, 15.28c FtW., 16c SF. Newell-Gutradt Co., San Francisco, item 51-S-1885, 10.95c LA. Hershey Estates Soap Div., Hershey, Pa., item 51-S-1920, 11.5c NY & DC, 12c Clev.

VA Soap Awards

Awards on cleansers and soap powder in a recent opening for miscellaneous supplies by the Veterans Administration, Procurement Division, Washington, D. C., went to the following:

American Soap & Washoline Co., Cohoes, N. Y., item 206, 2.62c; 209, 2.6c.

Chemical Mfg. & Distributing Co., Easton, Pa., item 130, 5.04c; 143, 6.79c; 159, 4.83c; 16., 5.95c; 163, 5.54c; 164, 146, 4.81c; 149, 5.76c; 150, 5.5c; 152, 6.11c; 153, 5.62c; 154, 5.94; 156, 5.69; 157, 6.7c; 5.79c; 165, 6.16c; 167, 7.58c; 168, 7.66c; 169, 4.98c; 171, 7.58c; 173, 5.84c; 174, 8.48c; 176, 5.73c; 177, 5.04c; 180, 4.65c; 181, 5.74c; 182, 4.88c; 183, 4.9c; 184, 7.52c; 185, 5.31c; 186, 7.07c; 187, 5.36c; 188, 7.48c; 189, 5.11c; 190, 6.82c; 191, 6.1c; 192, 6.32c; 193, 5.09c; 194, 6.79c; 195, 7.24c; 196, 8.36c; 197, 6.54c; 198, 6.34c; 199, 5.48c; 200, 7.58c; 202, 8.76c; 203, 4.66c; 204, 4.66c; 280, 3.39c; 281, 3.28c; 283, 3.15c; 285, 3.59c; 286, 2.87c; 288, 3.39c; 289, 2.91c; 290, 3.2c; 291, 3.29c; 293, 2.83c; 294, 3.72c; 304, 3.5c; 311, 3.29c; 314, 3.7c; 317, 3.44c; 319, 3.96c; 320, 2.9c; 325, 2.77c; 326, 3.21c; 333, 3.07c; 335, 3.13c; 338, 2.75c; 339, 3.07c; 342, 2.98c; 343, 3.12c; 346, 3.72c; 350, 3.44c; 352, 3.64c; 358, 3.35c; 360, 2.96c; 362, 3.09c; 363, 3.26c; 365, 3.63c; 367, 3.47c; 373, 3.56c; 382, 3.06c; 383, 2.96c.

Eagle Chemical Co., Milwaukee, item 129, 6.3c; 144, 145, 147, 151, 155, 160, 162, 170, 172 & 179, 6.3c; 175, 8c; 178, 7c.

Federal Chemical Co., Chicago, item 148, 6.7c; 210, 5.15c.

Murro Chemical Co., New York, item 208, 2.5c; 336, 3.7c.

North Coast Chemical & Soap Works, Seattle, item 379, 4.85c.

Pioneer Soap Co., San Francisco, item 323, 3.98c; 337, 3.9c; 345, 3.8c; 356, 3.8c.

Purity Soap & Chemical Co., Minneapolis, item 299, 3.91c; 312, 5.02c; 318, 3.95c; 322, 4.15c; 329, 3.55c; 348, 4.1c; 349, 3.62c; 353, 3.73c; 370, 4.3c 383a, 4.48c.

Safford Co., Tryon, N. Y., item 201, 7c.

Spazier Soap & Chemical Co., Santa Monica, Calif., item 277, 4.71c; 307, 5.61c; 324, 3.333c; 347, 5.19c; 359, 5.17c.

Stevens Soap Corp., Brooklyn, item 278, 4.25c 287, 2.9c; 340, 3.18c; 369, 3.4c.

Swift & Co., Chicago, item 128, 6.12c.

Tennessee Soap Co., Memphis, item 310, 3.72c.

Tesco Chemicals, Atlanta, item 205, 2.83c; 301, 3.65c; 355, 3.6c.

Valley Products Co., Memphis, item 279, 3.61c; 284, 3.53c; 292, 3.51c; 295, 4.01c; 296, 3.44c; 297, 3.54c; 298, 3.66c; 300, 3.44c; 302, 3.99c; 303, 3.77c; 305, 5.84c; 306, 3.45c; 308, 4.85c; 309, 3.66c; 313, 4.13c; 315, 3.45c; 316, 3.45c; 321, 3.62c; 327, 3.95c; 328, 2.6c; 330, 3.47c; 331, 3.27c; 332, 3.2c; 334, 3.18c; 344, 5.84c; 351, 3.69c; 354, 3.31c; 357, 3.98c; 364, 4.48c; 366, 3.91c; 368, 4.76c; 371, 4.19c; 372, 3.18c; 374, 4.15c; 375, 5.84c; 376, 4.23c; 377, 3.18c; 378, 3.72c; 380, 3.73c.

Western Soap & Sales Co., Spokane, Wash., item 381, 5.25c.

Grit Soap Award

M. Schneider & Sons, Brooklyn, received the award on 60,000 10-ounce cakes of grit soap with a bid of 5.5 cents per cake in a recent opening for miscellaneous supplies by the Army Quartermaster Corps, New York.

Scouring Powder Award

Janitors Supply House, Baltimore, received the award on an unspecified quantity of scouring powder with a bid of four cents in a recent opening for miscellaneous supplies by the Federal Supply Service, Washington, D. C.

VA Deodorant Block Awards

The following awards were announced on deororant blocks in a recent opening for miscellaneous supplies by the Veterans Administration, Procurement Div., Washington, D. C.:

Frank J. Curran Co., Downers Grove, Ill., item 13, 5.97c; 25, 5.50c; 27, 5.58c; 28, 5.53c; 53, 6.05c; 64, 5.97c; 75, 5.05c; 79, 6.-05c; 90, 5.27c; 102, 5.97c; 104, 6.05c.

A. M. R. Chemical Co., Brooklyn, item 1, 5.25c; 9, 4.5c; 32, 5.5c; 56, 5.25c; 61, 4.5c; 62, 5.5c; 63, 5.25c; 66, 4.75c; 73 & 74, 5.25c ea.

Janitors Supply House, Baltimore, items 10 & 11, 4.7c; 40, 4.6c; 84, 4.7c.

Puritan Chemical Co., Atlanta, item 2, 4.59c; 3, 4.6c; 4, 4.06c; 5, 4.29c; 6, 4.65c; 7, 4.65c; 8, 4.44c; 12, 4.06c; 14, 4.72c; 15, 4.62c; 16, 4.31c; 17, 4.73c; 18, 4.45c; 19, 4.59c; 20, 4.62c; 21, 4.45c; 22, 4.21c; 23, 4.85c; 24, 4.42c; 26, 4.55c; 29, 4.85c; 30, 4.44c; 31, 4.86c; 33, 4.44c; 34, 4.85c; 35, 4.73c; 36, 4.44c; 37, 4.51c; 38, 4.43c; 39, 4.62c; 41, 4.97c; 42, 4.65c; 43, 5.64c; 45, 4.8c; 46 & 47, 4.43c; 48, 4.69c; 49c, 4.36c; 50, 4.74c; 51, 4.63c; 52, 4.9c; 53, 4.63c; 54, 4.33c; 55, 4.42c; 59, 5.64c; 60, 4.63c; 65, 4.85c; 67, 4.6c; 68, 4.34c; 69, 4.69c; 70, 5.09c; 71, 5.4c; 72, 4.25c; 77, 4.97c; 78, 4.63c; 80, 4.67c; 81, 4.73c; 82, 4.62c; 86, 5.21c; 88, 5.14c; 92, 5.05c; 93, 4.95c; 94, 4.48c; 95, 5.02c; 96, 5.21c; 97, 5.32c; 96, 5.41c; 99, 4.65c; 100, 4.97c; 101, 4.95c; 103, 4.61c; 105, 4.88c; 106, 4.6c.

American Made

by

GEORGE LUEDERS & CO.

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NEW TRADE MARKS

THE following trade-marks were published in the July issues of the *Official Gazette* of the United States Patent Office in compliance with Section 6 of the Act of February 20, 1905, as amended March 2, 1907. Notice of opposition must be filed within thirty days of publication. As provided by Section 14, a fee of ten dollars must accompany each notice of opposition.

Parko—This for cleaning and polishing compounds for painted, varnished, enameled and lacquered surfaces. Filed Nov. 18, 1946 by Park Chemical Co., Detroit. Claims use since 1924.

Penta Preservative — This for chemical solution used for preserving lumber. Filed June 18, 1947 by Chapman Chemical Co., Chicago. Claims use since Aug. 1, 1946.

The following trade marks are published in compliance with section 13 (a) of the Trade Mark Act of 1946. Notice of opposition must be filed within 30 days of publication and a fee of $25 must accompany each notice of opposition.

O Cedar—This for waxes and polishes for furniture, walls, etc. Filed July 24, 1947 by O-Cedar Corp., Chicago. Claims use since June 1, 1907.

O Cedar—This for glass cleaners and polishes. Filed July 13, 1948 by O-Cedar Corp., Chicago. Claims use since Feb. 1, 1948.

Perfection—This for shoe cleaners. Filed Dec. 15, 1949 by American Polish Co., Chicago. Claims use since 1901.

Lawn Care—This for chemical preparation for controlling pests. Filed June 22, 1948 by O. M. Scott & Sons Co., Marysville, O. Claims use since July, 1946.

Steriklene—This for cleaning solution for electric shaver heads. Filed June 25, 1949 by Remington Rand, Inc., New York. Claims use since Feb. 5, 1948.

Jetsit—This for room deodorants. Filed June 10, 1949 by Eston Chemicals, Inc., Los Angeles. Claims use since Mar. 16, 1949.

R.D.S.-1410 — This for insecticide in liquid form. Filed June 17, 1949 by John Sexton & Co., Chicago. Claims use since Mar. 8, 1949.

Kare — This for insecticides. Filed July 30, 1949 by Windsor Wax Co., Hoboken, N. J. Claims use since Jan. 13, 1947.

Pentadine—This for chemical preparation for wood preservation. Filed Sept. 10, 1949 by American Chemical Paint Co., Ambler, Pa. Claims use since Aug. 19, 1949.

Glycolaire—This for electric air sterilizing machine. Filed Feb. 28, 1949 by Aeroglide Corp., Raleigh, N. C. Claims use since Jan. 3, 1949.

Glycolaire—This for electrical vaporizers for deodorizing and germicidal purposes. Filed Mar. 18, 1949 by Taylor Industries, Inc., New York. Claims use since Feb. 25, 1949.

Admiral — This for manually operated devices for applying insecticidal and fungicidal dusts. Filed Apr. 5, 1948 by H. D. Hudson Mfg. Co., Chicago. Claims use since July 31, 1947.

Windex—This for liquid cleaner for glass. Filed Sept. 21, 1949 by Drackett Co., Cincinnati. Claims use since Feb. 15, 1947.

Indraic Acid—This for mixture of petroleum wax and resin for hardening other waxes. Filed Mar. 25, 1948 by Industrial Raw Materials Corp., New York. Claims use since Feb. 1, 1948.

Master Glow—This for liquid floor polish. Filed Feb. 21, 1948 by Tru-Cote Manufacturing Co., Brooklyn. Claims use since July 17, 1947.

Aero-Klenz—This for room deodorant. Filed Mar. 22, 1948 by W. E. Anderson, Inc., Kansas City, Mo. Claims use since July 10, 1944.

Johnson's Ant Killer—This for insecticide. Filed May 11, 1948 by J. A. K. Co., Atlanta. Claims use since January, 1935.

Brasco — This for insecticides and rodenticides. Filed Oct. 27, 1948 by Bradford-Scott Manufacturing Co., Jackson, Tenn. Claims use since Apr. 7, 1948.

Neotran—This for parasiticide. Filed Dec. 13, 1948 by Dow Chemical Co., Midland, Mich. Claims use since Feb. 10, 1948.

Bufen-I — This for bactericide. Filed Mar. 10, 1949 by Buckman Laboratories, Inc., Memphis. Claims use since Jan. 6, 1949.

Mothalene — This for naphthalene and paradichlorobenzene insecticides and deodorants for moth prevention in clothes storage and for deodorizing closets and toilet bowls. Filed May 5, 1949 by Koppers Co., Pittsburgh. Claims use since 1889.

Sterozol — This for germicidal compositions for industrial and household uses. Filed May 11, 1949 by Wallerstein Co., New York. Claims use since Jan. 2, 1909.

Dimtie — This for insecticide miticide. Filed June 9, 1949 by Sherwin-Williams Co., Cleveland. Claims use since Mar. 11, 1948.

Toxatone—This for insecticides and pesticides. Filed June 9, 1949 by Sherwin-Williams Co., Cleveland. Claims use since Mar. 4, 1948.

Holadane—This for insecticide. Filed June 9, 1949 by Sherwin-Williams Co., Cleveland. Claims use since Mar. 12, 1948.

Zok—This for insecticides. Filed Aug. 9, 1949 by Catex Chemical Sales Co., Philadelphia. Claims use since Apr. 23, 1949.

Filaric—This for parasiticide. Filed Sept. 3, 1949 by Sharp & Dohme, Inc., Philadelphia. Claims use since Aug. 25, 1949.

Chimney Sweep—This for soot remover in the form of a chemical additive to fuel oils, etc. Filed Jan. 28, 1949 by G. N. Coughlin Co., West Orange, N. J. Claims use since Dec. 5, 1946.

EDP-Sol—This for fungicidal solution for external application to the skin. Filed Oct. 26, 1948 by Blue Ridge Laboratories, Clemson, S. C. Claims use since June 15, 1948.

Rubicon—This for shaving soap. Filed Nov. 26, 1947 by Hall, Thralls & Co., Hymera, Ind. Claims use since 1924.

Alrosol—This for detergent and wetting agent soluble in water and many organic solvents used particularly in cleansers and as a scouring agent. Filed Feb. 7, 1948 by Alrose Chemical Co., Cranston, R. I. Claims use since 1936.

Vicarfit—This for synthetic detergent in powder form for use in cleaning oil for polished surfaces. Filed May 29, 1948 by Virginia - Carolina Chemical Corp., Richmond, Va. Claims use since Apr. 13, 1948.

Busco—This for liquid powder and cake cleansing compounds. Filed Aug. 13 1948 by Buffalo Scientific Co., Buffalo, N. Y. Claims use since May 13, 1926.

Te-anne—This for toilet soap. Filed Dec. 20, 1948 by Nettie Rosenstein, Inc., New York. Claims use since June 17, 1948.

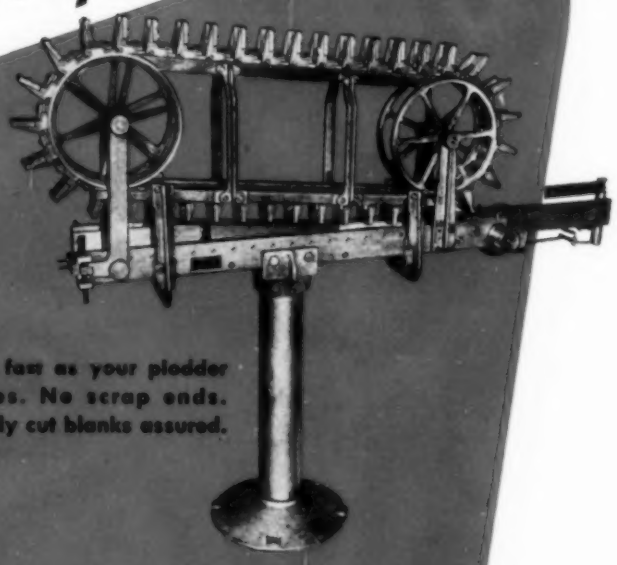
Kasmir Bouquet—This for soap. Filed Dec. 28, 1948 by Colgate-Palmolive-Peet Co., Jersey City, N. J. Claims use since Dec. 8, 1948.

Astarte—This for soap. Filed Jan. 3, 1949 by Allied Distributors, Pittsburgh, Pa. Claims use since Sept. 24, 1945.

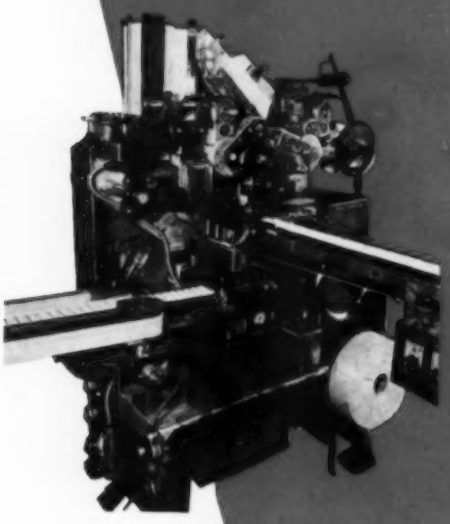
Purgo—This for liquids for cleaning automobile, steam or hot-water radiators. Filed Apr. 21, 1949 by Liquid Veneer Corp., Buffalo. Claims use since Mar. 31, 1928.

Frisk—This for all-purpose detergent. Filed Dec. 28, 1949 by American Colloids Co., Detroit. Claims use since December, 1945.

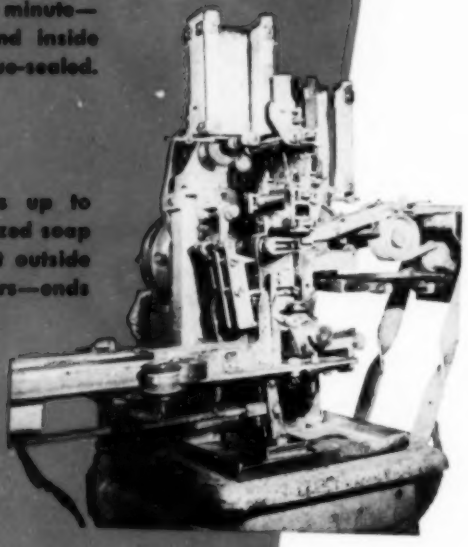
Speed up your Cutting and Wrapping



Cuts as fast as your plodder extrudes. No scrap ends. Uniformly cut blanks assured.



Automatic wrapping machine wraps up to 200 cakes of toilet sized soap per minute—with cut outside and inside wrappers—ends glue-sealed.



Automatically wraps up to 300 cakes of hotel sized soap per minute—with cut outside and inside wrappers—ends glue-sealed.

The above machines available for all sizes of soap.

Write for illustrated descriptive folders of these revolutionary wrapping and cutting machines.

HOUCHIN
MACHINERY CO., INC.

Manufacturers of Soap Making Machinery for over Three Quarters of a Century

SIXTH and VAN WINKLE AVES., HAWTHORNE, N. J., U. S. A.

PRODUCTION SECTION

Bentonite as a Soap Builder

Bentonite is selected for use in soap on the basis of alkalinity, regardless of swelling power. It improves the detergent actions of soap, and acts as a dispersant.

THE commercial importance of bentonite depends on its marked absorption, adsorption coalescence, chemical activity, effect on emulsion, and surface tension, or a combination of these factors. It is used as a builder in soaps, in various cosmetics, as a water softener, and for many other applications. In the activated state, bentonite is used for filtration and decoloration purposes.

A natural inorganic mineral, bentonite is formed by the weathering of volcanic ash. In the dry state, it does not cake, and may be shipped in cloth or paper bags. Its particle size is about .5 microns in diameter. The most outstanding property of bentonite is its ability to absorb large quantities of water, taking up as much as five times its weight.

Bentonite is selected for use in soaps on the basis of alkalinity, regardless of its swelling power. It improves the detergent action of the soap, and for this reason, is used to a large extent as a builder. Its absorptive, adsorptive, emulsifying, and colloidal properties have a direct bearing on the detergent action. It acts as a dispersing agent, and performs a similar function with soap in water. It also improves the efficiency of soaps by lowering the surface tension of the solution and forming suds.

Colloids have the property of absorbing an excess of positive or negative ions and acquiring a charge. Although bentonite is crystalline in nature, it behaves like a colloid. It is negatively charged, attracting carbon and other forms of soil particles, which fortunately are positively charged.

Bentonite softens water by base exchange action. Instead of precipitating the water hardening salts, it keeps them in solution by exchanging the base. It replaces the calcium and magnesium ions of the hard water by sodium and potassium ions and renders the water soft, at the same time absorbing the calcium and magnesium ions to itself. During washing, bentonite keeps the dirt in suspension, thereby preventing it from settling out. Soap holds dirt in suspension by deflocculating action. The ability to carry solid matter, is one of the outstanding features of bentonite, and one of the reasons that it is used in manufacturing hand soaps, and polishes.

The emulsifying power of bentonite is a very important property. Like soaps, bentonite emulsifies oil and grease of both vegetable and mineral origin. This sort of emulsification separates the solid matter, such as dirt, from the liquid matter. The former are loosened from the article to be cleaned and carried in suspension. By virtue of its emulsifying power, bentonite is used as an emulsifying agent for fungicides, and insecticides.

Methods of adding bentonite to soap differ with the nature of the soap being made. In the case of settled soap, the molten soap base is passed to the crutcher, where a warm paste of bentonite is thoroughly worked in. It is important that both the bentonite paste and soap be warm, otherwise lumps of bentonite may be left in the finished mass.

In the case of cold process soaps, the bentonite paste is added to the fat charge before the addition of alkali. The bentonite paste is mixed with the fats before saponification. It aids emulsification and speeds up the saponification process. Sometimes, the bentonite is dispersed in water, melted fats are stirred in, and the alkali added.

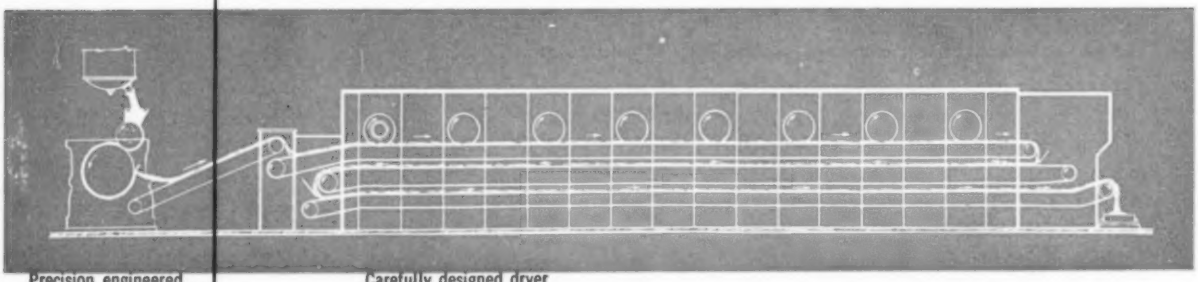
Bentonite paste is made by a simple, but slow process. Powdered bentonite is sprinkled on the surface of the water in small proportions, and the process repeated after the previous addition has been thoroughly soaked up, and has settled to the bottom. The water in the vessel should neither be stirred nor agitated until all the bentonite has been added.

Bentonite paste is added to liquid and paste soaps. For flake type soaps, the bentonite is added to the soap before drying and flaking.

It is not advisable that bentonite be added to soap as a powder in milling, as it cannot exhibit all the properties of the bentonite paste. The soap to which bentonite is added should not contain more than the normal percentage of free alkali, as it coagulates the bentonite. About 25-50 per cent of bentonite may be added ad-

takes both

for smooth performance



Precision engineered chilling machine

Carefully designed dryer

IN SOAP DRYING, TOO....

Smooth, top quality soap flakes are dependent upon two important factors—first, uniformly formed ribbons and second, carefully controlled drying. One without the other—and the finished flakes will not be top quality. There is no chance for uniform drying—even in the most carefully designed dryer—if the ribbons coming to the dryer vary in uniformity. Neither is there the slightest chance for uniform drying of the finest formed ribbons—unless conditions within the dryer are accurately controlled. Takes both for smooth performance.

Ribbon uniformity is governed by the degree of precision with which the chilling machine is designed and built. Proper drying is possible only to the extent that there is a uniform circulation of heated air, for the correct drying time and at the temperature to suit the character of the particular soap being dried.

Combining their knowledge of machine and dryer design and a thorough acquaintance with the needs of the soap manufacturer, Proctor engineers have developed the Proctor automatic flake soap system. This system provides a chilling machine that is designed and built to make uniform ribbons —and a dryer that permits careful control of all factors affecting moisture evaporation from the carefully formed ribbons. Temperatures, air-circulation and speed at which the conveyors carry soap through the dryer may be altered to meet individual requirements. The system is built with the precision of a delicate machine and the ruggedness of the Golden Gate bridge to assure you consistently fine results through many years of service. Write for details today.

PROCTOR & SCHWARTZ, INC.
625 TABOR ROAD
PHILADELPHIA 20, PA.

vantageously to soap. The normal maximum for semi-boiled soap is 40 per cent, and 7-10 per cent for toilet soaps.

A typical preparation for industrial cleaners contains the following ingredients in parts by weight: neutral soap, 30; bentonite, 30; synthetic detergent, 10; lanolin, 1; and perfume, 1. Other agents such as trisodium phosphate may be included in the mixture. The addition of sodium bisulfite imparts bleaching properties to soap-bentonite combinations. S.N. Sethu Madhava Rao *Soap* 3, No. 3-12 (1950).

Handling of Soap Scraps

THE problem of utilizing and handling soap scrap is approached most logically from three points: (1) reduction of soap scrap to a minimum, (2) keeping scrap as free of dirt as possible, and (3) the rapid disposal and handling of the scrap.

In checking soap scrap, the soap kettle should be examined for leakage, particularly around flanges, valves, fittings, etc. The next step is the inspection of storage tanks, which should be well insulated to prevent scrap formation by chilling. Finally, soap frames should be checked for leaks. Where necessary, joints should be caulked with paste made from dirty soap scraps, etc.

Handling and conveying equipment should be so arranged as to reduce scrap possibilities to a minimum. The units should be leakproof, and in sound working order. The formation of hollow troughs in the soap frames, may be controlled by keeping the frames warm and controlling the cooling rate, or by cutting off the half cooled soap from the sides, and ramming the surface level with a mallet.

Scrap May be Remilled

SCRAP from the plodding or milling machine may be returned directly to the mill. Similarly, scrap from cutting or stamping units may be returned also to the milling machine. Scraps for remilling, however, should be perfectly clean, as fresh as possible, and of convenient size. If there is any doubt about its suitability, the scrap should be set aside for reboiling or remelting. Old or hardened soap scraps should not be reworked in the mill, since they would yield gritty soaps, and impair the homogeneity of the product. Scraps from the dryer, soiled scraps and old scraps from the mill are best remelted in the kettle. There is no particular difficulty in reboiling the scraps, the most obvious drawbacks being the increased cost of labor, steam, perfume, and filling materials. If the scrap soap is clean and white, it may be ground to a soap powder, incorporated in scouring powder or some toilet preparations. If remelted, the clean scrap may be returned in small amounts to the crutcher. In some countries, the remelted soap is marketed as a second class product. Highly colored and dirty scraps are best utilized by incorporating in darker, lower grade soaps, such as tar soap or disinfectant soap.

Remelting equipment consists of a kettle equipped with wet and dry coils or a steam jacket, and a slow type agitator. Soap scraps, which have been reduced in size, where necessary, are introduced into the kettle, and may be sprinkled with water. The mass is heated and mixed slowly. A pearl ash solution may be added to the molten soap, followed by suitable additions of color and perfume. The soap is then passed into frames.

Molten scrap additions, cycled back to the crutcher, will usually show a tendency to darken the shade of the fresh soap, and modify its texture. For this reason, the optimum quantity to be added should be determined by experiment. The crutched mixture of fresh boiled and remelted soap is framed, cool pressed or drum dried in the usual manner.

Soap scrap from the cold process and the semi-boiled process, has been utilized by remelting, or by returning the soap in small amounts to the process. One method for handling the scrap is very similar to the semi-boiled process, using the same equipment with the addition of a large conical tank set above the crutching kettle. The kettle, should contain closed steam coils, or have a steam jacket operating at a pressure of below 60 psi. The kettle should also include an outlet "treacle" valve. Other equipment includes the oil and lye measuring tanks and soap frames.

Manufacturing Process

THE manufacturing procedure follows five main steps: (1) Soap cuttings and oil are charged to the conical tank, and the temperature raised to 200°F., (2) Fatty acids are charged into the kettle below the tank, and heated to 200°F. Lye, which has been heated previously to 72°, is added to the fatty acids. (3) The contents of the conical tank are charged to the acid-lye mixture, in the kettle below. (4) The balance of the fatty acids is added to the kettle. (5) Caustic lye is added to the mass to complete saponification. When saponification is complete, the soap is examined in the usual manner and framed.

Where the batch of manufactured soap is 2,464 pounds, the following formula applies:

	Pounds
Palm kernel or coconut oil or fatty acid	726
Palm oil fatty acid	364
Rosin	84
Lye solution (30°Bé.)	730
Scrap soap cuttings	560

If desired, sodium silicate solution, heated to the temperature of the mass, may be crutched in. The actual time taken for all operations is said to be approximately one hour, and as much as twelve tons of waste soap may thus be re-used in a 48-hour week. Lester Farrelly, *Soap Perf. & Cos.* 23, No. 6, 597-599 (1950).

P&S Production Head Dies

George Boothroyd Whitehead, production superintendent of Proctor & Schwartz, Inc., Philadelphia, died at his home July 17. He was 63.

Savings up to 50%
New soil suspending agent
FOR DETERGENTS!
NU-FILM is a starch acid ester derivative containing sodium carboxylate and sulfonate groups. It is considerably more economical than products currently being marketed as soil-suspending agents, and has demonstrated marked ability in this respect in repeated Research tests.
NU-FILM is particularly effective when compounded with detergents of the alkyl aryl variety. Whiteness retention tests on unsized cloths have shown that NU-FILM is a material aid in suspending soil and preventing re-deposition of dirt into cloth fibers. The illustrated test is typical. The unsized cloth to the left was immersed and agitated in a solution of standard soil plus a conventional detergent. Its twin (right) was agitated in a similar solution to which a small quantity of NU-FILM had been added. Compare the results!
NU-FILM solutions are extremely stable after cooking and make an ideal base for liquid laundry starches . . . while NU-FILM's unusual resistance to wet soil pick-up suggests further application as a textile size.
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WE'D LIKE TO TEST NU-FILM in our product development laboratories. Please send ☐ A sample ☐ Technical data ☐ Technical assistance. Have a National representative call on:
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Deodorant Soaps

Investigations of the chlorinated phenols as possible active ingredients in deodorant soaps indicate a satisfactory performance of hexachlorophene [*bis*(2-hydroxy-3,5,6-trichlorophenyl)methane] for this purpose. The compound is not irritating in the one to three per cent concentrations commonly employed, and is compatible with other soap ingredients, such as perfume, dyestuffs, etc.

Perspiration in itself is not malodorant. The odor becomes offensive only when bacterial activity causes decomposition of the organic material in the perspiration. Removal of the bacteria would, therefore, impart deodorant properties. Hexachlorophene soaps reduce the amount of resident bacteria on the skin to a greater extent than ordinary soaps. It is not germicidal, however, since not all bacteria are affected by the bacteriostatic properties of the hexachlorophene. Maximum efficiency can be maintained by use of the hexachlorophene soap, to prevent removal of the antibacterial film in a subsequent cleansing process. *Manuf. Chem.* 21, No. 6, 237 (1950).

Saponification Velocity

The addition of aromatic hydroxy compounds to cottonseed oil has a marked effect on the velocity of its saponification with caustic potash. The addition of phenol in the order of one gram per 106-200 grams of oil, greatly accelerated saponification with 51 per cent potash at 60°. This acceleration is due to an increase of the dispersity of the emulsion and to formation of phenolates, which dissolve in the soap and promote the penetration of the oil and the alkali into the soap layer. An increase in temperature counteracts the accelerating effect of the phenol, resulting in a lowering of velocity of saponification.

Due to the higher surface activity and greater solubility of naphthol, addition of this aromatic in amounts of .12 grams also accelerates the velocity of saponification with 51 per cent caustic at 60°, but with a greater efficiency than phenol. On the other hand, hydroquinone, resorcinol,

and pyrocatechol inhibit saponification. Generally speaking, an accumulation of OH groups lowers the catalytic activity, and a greater molecular weight of the hydrocarbon increases it. *Zhur. Obshchel Khim.* 20, 253-7 (1950), through *Chem. Abstracts.*

◆

Fatty Alcohol Uses

Higher fatty alcohols, such as the saturated compounds, cetyl and stearyl, and the unsaturated oily material oleyl alcohol, are now finding several important new uses. Due to their excellent stabilizing effects, high foaming power and emollient properties, they make satisfactory additives for toilet soaps, cleansing lotions, shampoos, ointments, etc. *Chemical Age* 42, No. 1615, 921 (1950).

◆

Film Drainage of Soap

Certain additives to solutions of detergents decrease the drainage rates and form very slow burning films. This slow drainage is attributed to high surface viscosity, which is a function of both the detergent as well as the added material. When a slow-draining film is formed, a sufficient increase in temperature causes a change to a fluid type. Such transition temperatures are useful in characterizing the flow properties of various mixtures. These properties have been related to foam drainage. However, an additional factor which affects the properties of foams is a variation in bubble size.

Aqueous solutions of pure detergents give fluid films with relatively fast drainage. Detergents containing a normal saturated hydrocarbon chain of at least 12 carbon atoms with a hydrophilic group in the terminal or in the beta position, tend to give very slow draining rates when certain types of organic compounds are added. These compounds have hydrophobic structures similar to that of the detergent.

Detergents having a highly branched chain, a cyclic structure or unsaturated groups (cis forms) in the hydrophobic part yield fluid films with the organic additives mentioned above. *J. Am. Oil Chem. Soc.*, 27, No. 7, 268-273 (1950).

Fatty Acid Recovery

Fatty acids entrapped in cooling system waters, which are to be discharged, may be recovered by reducing the specific gravity of the particles, and collecting the acids as a floating sludge. Waste water is charged into the recovery unit and flows downward, countercurrent to an upward flow of a large volumes of air. The air bubbles attach themselves to the free fatty acids, lifting them to the surface, where the sludge is skimmed with slowly rotating skimming blades. High removal efficiencies and heavy sludge concentration are provided in the recovery unit. F. Gibbs *Instrumentation* 2, 912, 8-10 (1950).

◆

Paraffin in Alcohol

Paraffin in synthetic alcohols may be determined by dissolving 10 grams of the sample in 100 grams of pentane, and passing the solution through a tube 500 mm. high, containing 100 grams of kieselguhr. A wash of 100 grams of pentane is adequate, and the combined solutions contain the paraffin. The synthetic alcohols are adsorbed. *Bull. mens. ITERG* 4, 61-74 (1950) through *Chem. Abstracts.*

◆

Glycerine Purification

Glycerine purification by the removal of ionized solids (ash), color and odor producing materials, yields a product more stable to light than by the distillation method of purification. There are no foots, since the purified solution may be concentrated without loss, and operating costs are lower, in most cases.

The non-ionized glycerine solution is passed in series through a cation exchanger and an anion exchanger, or through a mixed bed of cation and anion, or through a combination of these, removing about 90 per cent of the ionized material at one passage. In this way, the first passage will leave 10 per cent, while a second passage will leave one per cent or less of the original ionizable material. The number of passes required depends on the original concentration of the solution, and on how much ionizable material may be tolerated in the final solution.

The ion-exchange method has been used successfully with waste sweetwaters of three to five per cent glycerine, normal sweet waters of eight to 15 per cent glycerine, and even with soap crudes in which the ash content runs as high as 15 per cent. Any of the dilute glycerines produced by the ion-exchange method may be concentrated to a C.P. product without distillation. *Chemical Engineering* 57, No. 7, 109 (1950).

◆

Ethylene Synthesis

Unsaturated compounds, particularly those containing one or more ethylenic groups adjacent to the carbon atom, may be made by the preparation of an alkenyl lithium derivative and reacting this with secondary components. Reaction of purified isobutenyl bromide with lithium metal in dry ether, carbonated with an excess of CO_2, yields a mixture of 2:5 dimethylhexa-2:4-diene, b-b dimethylacrylic acid, and phorone. *Chemical Age* 43, No. 1618, 91 (1950).

◆

Boiler Scale Removal

Rust and mill scale may be removed from new boilers by the use of inhibited phosphoric acid. One of the main advantages of the phosphoric acid over inhibited hydrochloric acid, which has been used for this purpose, is that it can be boiled in the unit by direct firing. This is possible because the inhibitor is effective at the temperatures involved. Hydrochloric acid must be used below temperatures of 150-165°, as the inhibitor decreases in effectiveness above these temperatures, resulting in a greater attack of the metal. Furthermore, hydrochloric acid may be used only by soaking or recirculation, while the boiling of phosphoric acid introduces the vapors in regions not readily accessible. Still another advantage of using phosphoric acid is its greater stability, reducing the corrosive and fume problems of hydrochloric acid. Practical applications of the acid, indicate satisfactory results with a five per cent solution at atmospheric pressure. *Chemical Engineering* 57, No. 7, 268-273 (1950).

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TETRASODIUM PYROPHOSPHATE
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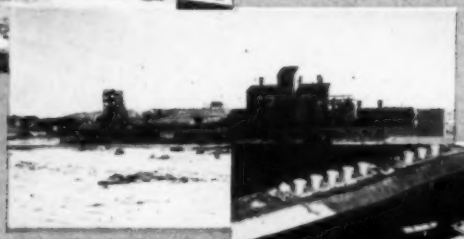

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fmc

PRODUCTION CLINIC

By E. G. THOMSSEN, Ph.D.

IN factory management, all difficulties do not increase in direct ratio to the size of the plant. Smaller plants, especially those making a variety of products, face production problems that are troublesome of solution. Details, such as investment of capital for new equipment used intermittently, keeping laborers' time occupied on limited production, sizes of batches to be produced and similar difficulties, arise frequently.

In visiting smaller plants, we note often that the methods for filling and finishing of liquid and dry products are often extravagant and crude. In many cases, the operators of such plants do not give ample attention to these details for they are more interested in the processing operations. As a result, much labor is wasted because primitive methods of packaging are employed. When this is called to the attention of such producers, the usual reply is that their volume is too small to consider the installation of even simple, semi-automatic equipment. Companies of this type should study such operations in greater detail and appraise their cost based upon today's wages. The results might surprise them. In many cases, it would be discovered that the installation of modern, labor-saving packaging equipment might prove a very profitable investment.

A few concrete cases based upon recent observations in several smaller plants will illustrate more clearly the points we are emphasizing.

It is still quite common to find bottles, cans and drums being filled from a spigot or with a funnel and dipper. In criticizing these outdated methods, a common retort has been that a certain number of men had to be employed anyhow. They might just as well waste their time on a slow method filling job as loafing on the job, we have been told on more than one occasion. This is a short-sighted attitude. A good plant manager can always find some task for his men to do during work interruptions. In plants which condoned such methods, we generally noted negligence in other directions. Disorderliness, lack of plant cleanliness and shiftlessness were evident. The time saved by installation of semi-automatic filling equipment could well be put to correcting these other defects. Not only that, but it would also result in more accurate filling with less damage to containers, mainly due to spillage and breakage. Semi-automatic fillers that are flexible and rapid are not expensive when compared with time lost at today's wage scales.

DR. THOMSSEN

The handling of containers subsequent to filling is another operation in which improvement in many cases is possible. Smaller plants commonly place the filled containers on a work table or even on the floor. From there they are picked up, often several times, for labeling and casing. Considerable time and space can be saved by using a conveyor table even if it is run only intermittently. Capping and labelling are expedited by the use of such a device.

The capping and labelling operations, as carried out in these small plants, are also open to much criticism. One may see screw caps being applied and tightened with the fingers very frequently. Small plants do not require automatic cappers and it is quite all right to start caps by hand. For tightening them, however, there are numerous cheap devices to be had that do a good job in this direction. To expect a man or woman to tighten down caps properly by hand is foolishness. Not only does such a method raise blisters but the tension of the closures varies, resulting in either leakage of containers or caps that are applied too tightly.

As to labelling, we have seen this operation performed in plants in very elementary ways. Work people are equipped with a large can of paste and a brush that is much too wide to apply labels of various sizes. It really looks clownish to observe the procedure. The finished job looks more amateurish than the method of application. The main reason met for such conditions is that an unimaginative workman is left to his own devices for the labelling job. He does not have enough ingenuity even to use a labelling board. He knows nothing about the inexpensive semi-automatic paste applying machines, so, he does the best he can using the tools at hand which he also employs for sealing the corrugated shipping cartons. He does not realize the label is most often the first thing the ultimate user examines upon receiving the product. An unfavorable customer reaction to the product may be due to this first impression. If a soiled or crooked label is on the package, repeat business may be difficult to obtain. Surely, it is good business to label products neatly as well as economically.

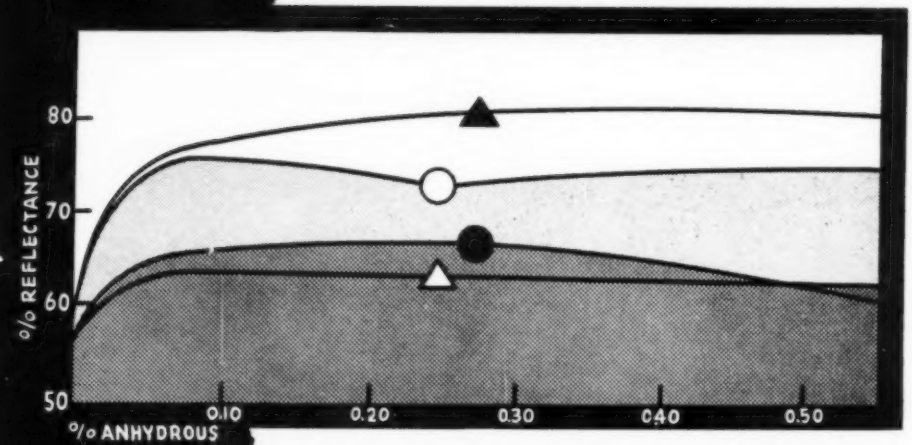
What has been stated here may appear to be facetious and overemphasized. It is based, however, upon actual observations over a period of years. We have mentioned only the handling of liquids. The same criticisms may be leveled also at powder

Silicate-Synthetic Detergents... Outstanding for WHITENESS

A combination of a PQ Silicate and a synthetic is a sure way to step-up the synthetic detergents' performance. For instance, in the prevention of dirt deposition.

A look at the chart shows how PQ Silicates added to dodecyl benzene sodium sulfonate improve detergency in this respect. The result is very evident — cleaner, whiter whites, and what is also very important — there's a worthwhile saving in the cost of raw materials.

May we discuss with you how PQ Silicates add better detergency to synthetics at a reduced cost?



Prevention of deposition of raw umber by detergents at 60° C.*

△ 60% dodecyl benzene sodium sulfonate

● 60% dodecyl benzene sodium sulfonate — 40% Na_2SO_4

○ 60% dodecyl benzene sodium sulfonate — 40% sodium metasilicate ($Na_2O.SiO_2$)

▲ 60% dodecyl benzene sodium sulfonate — 40% Silicate ($Na_2O.2.1SiO_2$)

**From "Alkyl Aryl Sulfonate-Builder Mixtures" — Reprint #1-15*

PHILADELPHIA QUARTZ COMPANY
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and paste filling. While we have considered mainly smaller plants, some of the points raised apply to larger production. It is constructive in plant management to survey such operations periodically and improve upon them frequently.

Water Demineralizer

A LOW cost demineralizer that gives mineral free water from ordinary tap water is offered by Penfield Manufacturing Co., Meriden, Conn. It treats water for flow rates from 30 to 1500 gallons per hour. Laboratories and chemical manufacturers using water as a raw material are potential users. It operates on the well-known ion exchange principle but, unlike certain other demineralizers, the cartridge containing the ion-exchange resins is discarded instead of being regenerated when the resins are exhausted. The apparatus consists of this removable cartridge, a cast aluminum bracket as a support, and an electronic conductivity meter to measure continuously the acceptability of the effluent water.

Dry Fire Extinguisher

A HANDY type of light weight fire extinguisher, containing dry powder, is made by Walter Kidde & Co., Belleville, N. J. This piece of equipment is built in 20-lb. and 30-lb. units, is simple to recharge and is built to last a long time. A 20-lb. unit will blanket a 36-square foot area.

Speed Reducer

A SPEED reducer that requires no special mounting has been developed by Dodge Manufacturing Co., Mishawaka, Ind. This compact, fixed 15:1, reduction device may be installed directly on the driven shaft without the necessity of any flexible coupling or foundation. Adjustment of belt tension is amply provided for. As it is light in weight and the design is simple, the speed reducer may readily be shifted from one location to another. Six sizes up to 28½ H.P. are available. Conveyors, bucket elevators, conveyor tables and chemical processing machinery are potential fields for which this device may find applications.

Flask Shaker

LABORATORIES which require a versatile shaking apparatus for a large number of flasks will find the "Flask Shaker" built by Laboratory Apparatus Manufacturers, New Brunswick, N. J., advantageous. This rotary type shaker is particularly useful where vigorous aeration is desired and where pellicle formation is to be avoided. Sterilization is simplified by its use. Two models are available.

Chime Repair Machine

LARGER manufacturers who reuse steel drums in quantity may be interested in the Junior Universal Chime Machine made by L. M. Gilbert Co., Philadelphia. This low priced machine may be used in a number of ways. It straightens, rolls and seals the chimes of any closed or open drum of from five to 110 gallon sizes. It repairs the bead end of any size open drum rapidly by merely turning the drum over. It shears the head from closed drums close to the inside body, rounding the end and leaving a smooth cut. The machine weighs about 1150 pounds and its actual operation in reconditioning drums requires but the fraction of a second.

Vertical Shaft for Mixers

VERY often it is desired to install a long vertical shaft driven agitator in a mixing tank. Rigidity is necessary in most cases. The Philadelphia Gear Works, Philadelphia, produce a "Steeple" type worm gear reducer which is well adapted for the solution of this problem. It is unnecessary to install a bottom support when this gear is used because a wide bearing span insures rigidity. Proper lubrication of the upper bearing is assured without the necessity of any stuffing box.

New Mathieson Plant

Chemical Plants Division of Blaw-Knox Co., Pittsburgh, has been awarded a contract by Mathieson Hydrocarbon Chemical Corp., Baltimore, for the engineering and procurement of a large new chlorine and caustic soda plant to be located at Saltville, Va.

Expected to go into operation in 1951, this new chlorine production unit will be one of the most modern in the United States. The design will be based on the Mathieson mercury cell process, which produces chlorine and rayon grade caustic soda of 50 per cent concentration directly from the cells.

Blaw-Knox has been authorized by Mathieson to build chlorine and caustic soda plants using the Mathieson mercury cell technique and licenses.

New Phosphorous Unit

Plans to construct the sixth electric furnace in Monsanto, Tenn., for the production of elemental phosphorous were announced recently by Monsanto Chemical Co., St. Louis. The new furnace will be the largest of its type in the world.

Brant Joins Toni

Dr. Joseph H. Brant was appointed recently director of research for the Toni Co., Chicago. He was formerly director of research for Bates Manufacturing Co., Lewiston, Me.

New Vacuum Filler

A new model "SF" vacuum filler, designed as a companion to its bench and portable type fillers was announced recently by Scientific Filter Co., New York. The new filler, designed for handling a large variety of products in many different container sizes up to quarts in glass or tin, provides many of the features of the larger, semi-automatic vacuum fillers. It is equipped with a self-contained vacuum unit which fills bottles directly from a supply container on the floor, thus eliminating the need of overhead storage tanks. The filler handles all types of liquids and requires only one operator. Spouts are fully adjustable and change-overs require about five minutes as all liquid contact parts are self-cleaning.

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Samples
and
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Columbia Chemical Booklet

"Products of Columbia," a new 26-page booklet, containing a concise outline of the range of chemical products for industry offered by the Columbia Chemical Division of the Pittsburgh Plate Glass Co., Pittsburgh, is now available, it was announced recently.

Thumb indexed, the new booklet is an extensive revision of an earlier version issued under the same title. New products have been incorporated, as well as a brief description of the nature and characteristics of all Columbia products. Included are typical uses of the various Columbia chemicals and a listing of the types of containers employed in the distribution of each.

Copies may be had upon request to the Pittsburgh Plate Glass Company, Columbia Chemical Division, Fifth Avenue at Bellefield, Pittsburgh 13, Pa.

2-Ethylbutanol Price Cut

The price of 2-Ethylbutanol has been reduced from 28 cents to 26 cents per pound in tank car lots, according to a recent announcement by Carbide and Carbon Chemicals Division, Union Carbide and Carbon Corp., New York. The price in carload lots of 55-gallon drums has been reduced from 29.5 cents to 27 cents per pound. The new price in less than carload lots in 55-gallon drums is 28 cents per pound. 2-Ethylbutanol is used in the preparation of surface-active agents of the alkyl naphthalene sulfonate type.

New Small Size Labeler

A new office model, motor-driven label paster was introduced recently by Potdevin Machine Co., Brooklyn. The "Mini-Labeler" is sturdily constructed of metal and finished in crackle green. The machine is adjustable to apply the desired amount of adhesive to the work while the ungummed side remains clean. Interchangeable heads are designed for cold glue application of half inch margin or overall pasting of labels up to four inches wide and any length. Both reservoir and coating roller are made of bronze to avoid corrosion. The "Mini-Labeler" measures eight inches wide, 12 inches long and seven and one-half inches high.

Fat, Oil Patent Report

A 28-page report covering 212 official patent extracts on the subjects of fatty oils, fatty acids, waxes, etc. was issued recently by Patent Publications, Inc., Washington, D. C. The patents, extracts of which are shown, are in the public domain and may be used by American manufacturers, the original 17-year period of validity having elapsed. Price of the report is $4.

New Microscopes

A new series of AO Spencer Phase Microscopes with monocular and binocular bodies was announced recently by the instrument division of American Optical Co., Buffalo, N. Y. Phase microscopy is a relatively new method of microscopy which permits the study of living organisms as well as other transparent materials of inherently low contrast.

R&H Amines Available

The availability of tertiary-octylamine and "Alkylamine 81," two new primary, aliphatic amines, applications of which include use as intermediates in synthesis of insecticides, bactericides, fungicides, detergents, wetting agents, etc., was announced recently by Rohm & Haas Co., Philadelphia.

Tertiary-octylamine, 2,4,4-trimethyl-2-aminopentane, is a pure eight carbon amine, boiling at 140° C., while "Alkylamine 81" is a mixture of highly branched primary amines, with the number of carbon atoms varying from 12 to 15. It has a boiling range of 220-260° C. Both products are supplied as clear, straw-yellow, distilled liquids, with good color retention. They are comparable in basic strength to straight chain aliphatic amines of the same molecular weight range.

Samples and technical literature containing experimental directions for many of the reactions of these amines are available from the company.

New Fritzsche Price List

Announcement of the issuance of its latest wholesale price list of essential oils, aromatic chemicals and related materials was made recently by Fritzsche Brothers, Inc., New York. Distribution is limited to those who buy in wholesale quantities.

New Microphotometer

A new light scattering microphotometer which measures 20 microlumens of scattered light was introduced recently by American Instrument Co., Silver Spring, Md. It may be used with any of the accepted techniques for molecular weight, particle size, microfluorescence, depolarization, dissymmetry and microturbidity measurements.

Details are given in Bulletin 2182, which is available by writing the company.

Synthetic Perfumes Book

Synthetic Perfumes by T. F. West, H. J. Strausz and D. H. R. Barton. Published by Edward Arnold & Co., London. Distributed in the United States by Longmans, Green & Co., New York. 388 pages, 5½ x 8½ inches, cloth binding, price $14.00.

A group of monographs dealing with the chemistry and preparation of about 175 synthetic perfumes are compiled in this text. In addition to the organic chemistry, notes on the use of the compounds, and physical constants which might be useful in checking the purity or identity of the samples are considered.

The perfumes are classified into 10 main sections: hydrocarbons, alcohols, aldehydes, ketones and lactones, ethers, esters, phenols, nitrogen containing compounds, and a miscellaneous listing for the acetals, compounds with the odor of ambergris, and the essential oils from violet flowers and leaves. In addition to the monographs mentioned, an addendum covering large ring ketones and lactones, and the irones is included also. An appendix of 260 trade names lists probable chemical constitution, and characteristics of odor and flavor. An author and subject index completes the text.

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THE ECONOMICAL DETERGENT SILICATE

Cowles DRYMET, anhydrous sodium metasilicate, is the most highly concentrated form of sodium metasilicate available. It is more economical to use, on the basis of both Na_2O (alkalinity) and SiO_2 (silicate) than any other type of hydrated or anhydrous detergent silicate, either compounded or by itself. DRYMET contains no water of crystallization.

DRYSEQ*

THE ALL-PURPOSE DETERGENT SILICATE

Cowles DRYSEQ, anhydrous sodium sesquisilicate, is a medium pH alkaline cleaner which will do fast, dependable work at a low cost to the user. It is a white, free-flowing powder, quickly and completely soluble in hot or cold water—containing 56.75% Na_2O—making it an economical base material for compounding.

DRYORTH*

THE HEAVY-DUTY DETERGENT SILICATE

Cowles DRYORTH, anhydrous sodium orthosilicate, is a powerful, speedy, heavy-duty cleaner with valuable penetrating and wetting-out properties, reinforced dirt-removing power and unusual emulsifying action. It is an anhydrous, free-flowing powdered silicate containing not less than 60% Na_2O, which may also be used as an economical constituent of high pH cleaning compounds.

CRYSTAMET*

THE MEDIUM pH DETERGENT SILICATE

Cowles CRYSTAMET is a pure, perfectly white, free-flowing granular pentahydrate sodium metasilicate with the normal 42% water of crystallization. Suggested for compounding when it is desirable to lower the concentration of a finished product. Readily soluble—chemically stable—easy to handle. Can be used on medium pH jobs.

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PRODUCTS AND PROCESSES

New Shaving Cream

A potassium soap, in the form of a viscous paste, and suitable for use as a shaving cream, contains 30 parts of a potassium soap of α-glyceryl stearic acid, 30 parts stearic acid, 12 parts potassium hydroxide (S.G. 1.51), and 28 parts of water. This product may be improved by using up to five parts of an alkanolamine soap of α-glyceryl stearic acid to replace a corresponding amount of the potassium soap. *Schimmel Briefs* No. 164 (1950).

Hair Bleaching Shampoo

A shampoo designed to bleach the hair contains the following ingredients:

	Parts
"Fewa" Powder	70
Sodium Perborate	10
Borax	10
Sodium Carbonate	10

Perf. & Essent. Oil Record 41, No. 4, 119 (1950).

Floor Cleaner

A liquid potash-oil soap designed for use on floors such as marble or tile contains 13 parts potash-soybean oil soap, three parts pine oil, eight parts soda ash (58 per cent), six parts hexametaphosphate, and 70 parts water. The product is a liquid soap concentrate which is diluted for use. *Chemical Industries* 67, No. 1, 66 (1950).

Fatty Acid Determination

A method for determining fatty acids in soap by filtration is as follows: 5-10 grams of the soap sample are dissolved in about 50 mg. of water, and the fatty acids separated with hydrochloric or sulfuric acid. Boil the mixture until the fatty acids are clear. In the presence of large amounts of volatile fatty acids, bring the mixture to the boiling point in an oven at 80°. Filter the fatty acids on a fluted filter, and wash with hot distilled water, until free of acid. Rinse filter with 10 ml. ethyl alcohol, dissolve the fatty acids in ethyl alcohol or ethylene oxide into a weighted flask. Distill the solvent and weigh. *Seifen-Ole-Fett-Wachse* 76, 93-4, (1950).

Floating Soap

Temperatures and consistency of soap base are prime factors in the preparation of a floating soap. The temperature should not exceed 85° to favor conditions for the air in soap emulsion. A satisfactory soap may be made from one-third coconut oil and two-thirds tallow; perfumes with saponification values below 100 are most suitable. *Alchimist* 4, No. 5, 109-112 (1950).

Toilet Soap Production

Saponification of fatty acid esters with alkali in the presence of a liquid diluent for the soap allows the elimination of the usual salting out and water dilution of the soap prior to milling. In such an operation, 75 pounds of anhydrous sodium hydroxide, and one-half the required alkali are added with stirring to 1000 pounds of the methyl esters of palm oil fatty acids (saponification no. 2151), which have been heated to 100°. After dispersion of the soap, 77 pounds of sodium hydroxide and 100-200 pounds of water are added, while the mixture is kept at 125°. The resulting soap mass can be milled directly; the alcohol liberated during saponification is easily recovered. U. S. Pat. 2,494,127, Jan. 1950.

Cleaning Composition

Two base mixtures, which can be mixed in the ratio of 10 to one part sodium perborate, designed for general cleaning contain the following:

	I Parts	*II* Parts
magesium sulfate	1	.7
Na_3PO_4	3	—
sodium silicate	6	—
sodium pyrophosphate	24	12
soda ash	8	—
water	13	18
soap	43	35
sodium aluminate	—	2.3
sodium metasilicate	—	4
sodium hexametaphosphate	—	12
sulfonated lauryl alcohol	—	20

Ital. Pat. 439,782 through *Chem. Abstracts.*

Waterproofing Solution

An aluminate stearate solution for waterproofing and coating purposes contains: 40 per cent aluminum stearate, 15 per cent ethyl octyl orthophosphate, and 45 per cent hydrocarbon solvent (b.p. 175-215). Other esters which might be used include dioctyl acid orthophosphate, isoamyl-octyl acid orthophosphate and diethyl acid orthophosphate. U. S. Pat. 2,494,-331, Jan., 1950.

Barium Salt Softeners

Investigations of the barium salts as water softeners indicate that barium chloride and barium carbonate, although effective, are not economical. Barium hydroxide, and Ba Al_2O_4, which acts like $Ba(OH)_2$ by hydrolysis, are effective only if the water does not contain Mg ions, or only Mg ions and no Cl ions. *Schwelz Arch. angew. Will. u. Tech.* 16, 21-5 (1950), through *Chem. Abstracts.*

Detergency Evaluation

The detergency of 28 different types of chemical products on woolen cloth was compared using an Atlas launderometer. The cloth was soiled with the oil used in its manufacture, in this case a self emulsification mineral oil, Woolrox 2000. Products were tested with: 1.) no builder, 2.) using an alkaline builder, sodium carbonate, and 3.) using a neutral builder, sodium chloride. Comparisons were made on the basis of concentration and money value. Neutral scouring with a polyoxyethylene thioether, using sodium chloride as a builder was found to be very effective in removing the soil. This combination was superior to all others tested. K. S. Lafleur *Amer. Dyestuff Rep.* 30, No. 12, 385-388 (1950).

FOUR U. S. MACHINES FOR CLEANING CONTAINERS

For Automatic Cleaning by Compressed Air

The "U. S. Sanitair" offers exclusive cleaning and bottle handling innovations that command consideration wherever automatic air cleaning of containers is desired. Write for Bulletin.

Semi-Automatic Cleaning by Compressed Air

As a two-tube machine the "E-Z Air Cleaner" is unbeatable. Requires no skill for fast operation. Furnished with compressor or air filter ready for connection to your air line. Write for Bulletin.

Automatic Bottle Handling

A—An automatic Unscrambler

B—An automatic Washer

The "Load-A-Matic" will unscramble, wash, rinse and drain automatically as high as 26,000 bottles an hour. Thorough cleaning, using a minimum amount of water. Write for Bulletin.

Bottle Rinsing & Cleaning

The "U. S. Rotary Rinser" is adjustable to any size bottle, jar or jug from ounce to including gallons. Washes inside and out on one turn. For hot or cold water or steam. Washing operation is automatic.

The above unit is also made for preparing and cleaning ampules and small serum bottles. Write for details.

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U.S.I. CHEMICAL NEWS

August ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1950

New Lauryl Sulfate Surface Active Agent Marketed by U.S.I.

A new lauryl sulfate surface active agent is now being marketed by U.S.I. under the trade name SIPON L-20. The unusual composition of the product particularly recommends its use where high foam and detergency coupled with mild action on the skin are desired.

SIPON L-20 is the first surface active agent marketed as the result of a broad detergent development program undertaken jointly by U.S.I. and Societe Sinnova of Paris. A new production unit is nearing completion in Baltimore and additional products will be offered in the near future.

Urethan Halts Progress Of Lymphomatous Cancer

Oral administration of urethan is reported to have produced an abatement of the symptoms of mycosis fungoides, a lymphomatous cancer condition, in four of nine patients, for periods lasting from three to nineteen months. The drug was given as a 20% solution in syrup of raspberry, in doses ranging from 1 to 5 gm. per day, according to the physicians who made the treatments.

Effects on four of the patients were described as favorable and apparently significant, although temporary. Improvement consisted of relief of itching, repression of tumors, and epithelization of ulcers, the physicians state.

Eight New Antibiotics From Vegetables, Fruit

Eight new antibiotics, discovered in cabbages, sweet potatoes, and bananas are being tested for their antibacterial and antifungal potentialities. A pure crystalline antifungal agent has already been isolated, it is reported, from dried leaves of cabbage. A wilt-resistant variety of sweet potatoes is said to have yielded an extract which combats wilt-producing fungi in tomatoes. Another extract is described as active against bacteria which cause boils. Tests also indicate that extracts of chemicals produced during ripening of bananas are of a very high potency.

New Manual on Finishing And Maintaining Floors

A new manual is reported available which helps analyze specific floor problems and tells how to prepare floors for finishing, how to apply coatings, and how to maintain them. Included are sections on floors of the following types: wood (including gymnasium floors or other floors where athletic activities are held), asphalt tile, rubber tile, linoleum, concrete, cork, terrazzo, magnesite, marble, and masonite.

Stored Grains Protected By New U.S.I. Products

New Pyrenone Protectants for Use on Wheat And Other Grains and Seeds Now in Commercial Production

Culminating four years' intensive laboratory investigation including two years of extensive field trials, U.S.I. announced late in July the commercial production and availability of two new products for the protection of wheat and other stored grains and seeds against insect infestation.

This dramatic close-up shows what a weevil infestation can do to wheat. The white, dusty material is known as "Frass" — "farinacious matter." A treatment with Pyrenone Wheat Protectant when the grain was put in storage could have prevented this damage.

Pyrenone Wheat Protectant is recommended solely for use on wheat and was developed to meet the special requirements imposed by the normal trade methods of handling and processing wheat, and uses pulverized wheat ground to a special mesh as a diluent.

Pyrenone Grain Protectant, based on a specially selected mineral diluent, has a broader field of usefulness and is recommended for use on corn, barley, rice, oats, and other grains and seeds under any conditions where the presence of a small amount of an added mineral is not objectionable.

(Laboratory and field tests demonstrated that the choice of a diluent is of vital importance in the performance of these protectants and further study may lead to the introduction of several more highly specialized protectants to meet the individual requirements imposed by certain crops.)

Insect losses in stored grains, seeds, etc., are of enormous economic consequence. Even in this country where techniques of harvesting and storage are far more advanced than in many areas, losses are estimated to range from a low of 2 or 3% under the best conditions to as high as 50% on some crops under adverse conditions. The average damage has been estimated at as high as 5% which in the U. S. alone would approximate 250,000,000 bushels or roughly $500,000,000.00

MORE

Makes Synthetic Rubber Without Use of Styrene

A new synthetic rubber called polybutadiene rubber is made from butadiene and requires no styrene, a large oil company announces. If successful the new synthetic may end the shortage of man-made rubber. Styrene, an essential ingredient in the synthetic known as "GR-S," is obtained from critically-short benzene, while butadiene, made from petroleum, can be produced in increased quantities in existing plants to meet the present heavy demand for synthetics, the announcement said.

Road tests indicate that the new synthetic is superior to GR-S and perhaps to natural rubber for tire treads. It may even be equal to "cold rubber" in quality, it is claimed. In the development process, polybutadiene latex is said to have been mixed with carbon black before conversion to solid rubber. A softer polybutadiene reportedly was obtained under moderately low temperatures.

Prevent Corrosion of Iron And Steel with Tungsten, Molybdenum Compounds

Corrosion of iron and steel by circulating water can be almost completely prevented, university scientists report, by addition of small amounts of tungsten and molybdenum compounds. Dissolving a few hundred p.p.m. of the compounds in circulating water or brine will stop rusting, it is claimed.

The compounds, sodium and potassium tungstate and sodium and potassium molybdenate, are at present more expensive than the chromates but have the advantage of being colorless, whereas the chromates are a vivid yellow. Their colorless properties suggest possible use of the compounds in such products as anti-corrosive paints.

Publishes New Free Guide To Photometric Analysis

A new manual on photometric methods of analysis has been published by a large laboratory equipment manufacturer with the aim of: (1) clarifying symbols and terminology (2) discussing range and accuracy of different methods (3) enabling the analyst to choose the operating conditions, filters, etc., best suited to the particular need.

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August ★ **U.S.I. CHEMICAL NEWS** ★ 1950

CONTINUED

Stored Grain

Up to the present these losses have only been held in check to a degree by the slow improvement of storage facilities and techniques and by more or less frequent fumigation to keep the degree of insect infestation from getting completely out of hand.

Georgia Snap Corn with husk removed to show weevil damage. 90% of the nutrient value of this corn has been destroyed by the insect infestation, making it unfit for use as animal feed.

Pyrenone Protectants, which can and should be mixed with the grain at the time of storage and before serious infestation has had an opportunity to develop, will protect the grains for a full storage season and quite possibly longer. Full tests on commercial quantities of grain treated and stored under normal commercial conditions have included wheat, corn, barley, rice, and oats, while tests now under way extend the investigation to numerous other crops.

Present economic losses include not only shrinkage (loss in weight due to insect damage) but down-grading of grains due to excessive insect infestation. An additional factor of increasing importance is the highly undesirable presence of insect fragments in flours and meals.

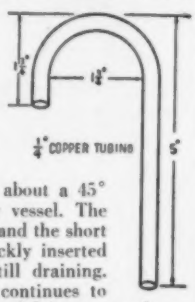
The protection of stored grains against infestation by the direct addition of a protectant material was rendered possible only by the unique combination of qualities possessed by the Pyrenones, namely, effectiveness against virtually all the common grain-destroying insects plus a practically complete freedom from toxicological hazards of any kind. Years of experimental work, which still continues intensively and will for a long time to come, have been required to arrive at the most effective formulations. The net result is the development of these completely new products and techniques which represent an enormous contribution toward the solution of one of the world's worst insect control problems.

Both availability and distribution will be limited in 1950. Pyrenone Wheat Protectant will be available in reasonable quantities for use in Kansas-Oklahoma areas, generally regarded as most serious from the standpoint of insect infestation, and in the Pacific Northwest. Pyrenone Grain Protectant during 1950 will be used mostly on Southern corn wherein infestation and consequent losses are terrifically severe. Ample quantities of both, however, will be available for commercial experiments in other areas and on other crops.

Plans for availability in 1951 are much more extensive and involve manufacture of the Pyrenone Protectants at numerous points selected to best serve areas of larger use. Major production activities will be concentrated in Kansas but supplemental plants in other large consuming areas are being built.

Good to the Last Drip

A pharmaceutical manufacturer reports that use of a handy, easy-to-make gadget for draining drums, particularly those containing expensive tax-paid alcohol, helps him to get more complete recovery of contents. The gadget is a siphon tube made from an eight-inch length of ¼-inch copper tubing. In operation, the small bung in the end of the drum is loosened but not removed and then the drum is tilted to about a 45° angle over a suitable vessel. The bung is then removed and the short leg of the siphon quickly inserted while the liquid is still draining. The siphon fills and continues to run until the last spoonful is recovered.



TECHNICAL DEVELOPMENTS

Further information regarding the manufacturers of these items may be obtained by writing U.S.I.

For removing rust stains on fabrics, a new formulation containing hydrofluoric acid is described as fast-acting and harmless to fabric. **(No. 589)**

To make aluminum as tough as heavier steel alloys, a new hard coating is applied electrochemically in thicknesses from 0.0001 to 0.006 inches, it is claimed. It is wear-resistant and insulates the metal against heat, the makers state. **(No. 590)**

To dispel unwanted odors, a new four watt lamp bulb, operating on household current, gives off just barely noticeable concentrations of ozone and has a mild germicidal effect, according to the makers. **(No. 591)**

A new plastic, claimed to bridge the gap between soft and hard rubber, meets the need for a high-strength material resistant to abrasion and chemicals and capable of production in varying degrees of flexibility. **(No. 592)**

A new, non-toxic wax activator, reported to be an efficient spreading agent for paraffin and microcrystalline waxes, plasticizes paraffin wax and greatly improves penetration of wax into porous materials such as paper and textiles, the makers assert. **(No. 593)**

Two new rust inhibitive white lead pigments, reportedly non-reactive toward vehicles containing free carboxyl groups, are available in commercial quantities. **(No. 594)**

A new caution-label dispenser for marking hazardous chemicals has three different rolls of cellulose tape labeled "corrosive," "poison," and "flammable," each in a different color, it is reported. **(No. 595)**

For quick determination of moisture content of wood and plaster, a new portable instrument is said to indicate per cent moisture direct, at the touch of a button. **(No. 596)**

To fill drums to correct weight, an extremely accurate, automatic, air-operated device is claimed to handle oils, paints, varnishes, chemicals, syrups, and food products. Unit is said to operate rapidly, and flow can be regulated to suit material and operation. Device operates safely under hazardous conditions and one man, unskilled, can handle two units, it is reported. **(No. 597)**

For instant measurement of films such as porcelain enamels, platings, leathers, paints, foils, plastic sheeting, glass, paper, rubber, lacquers, tinnings, etc., a new light-weight, vest-pocket size dry film thickness gauge is claimed to have an accuracy of ± 5% ± 0.0001 inch. **(No. 598)**

PRODUCTS OF U.S.I.

ALCOHOLS
Amyl Alcohol (Isoamyl Alcohol)
Butanol (Normal-Butyl Alcohol)
Fusel Oil—Refined
Propanol (Normal-Propyl Alcohol)
Ethanol (Ethyl Alcohol)
Specially Denatured—all regular and anhydrous formulas
Completely Denatured—all regular and anhydrous formulas
Pure—190 proof U.S.P., Absolute—200 Proof
Solox*—proprietary solvent—regular and anhydrous
ANTI-FREEZES
Super Pyro* Anti-Freeze
U.S.I. Permanent Anti-Freeze
ANSOLS
Ansol* M
Ansol* PR
ACETIC ESTERS
Amyl Acetate—Commercial and High Test
Butyl Acetate
Ethyl Acetate—all grades
Normal-Propyl Acetate
OXALIC ESTERS
Dibutyl Oxalate
Diethyl Oxalate
PHTHALIC ESTERS
Diamyl Phthalate
Dibutyl Phthalate
Diethyl Phthalate
Diisooctyl Phthalate
OTHER ESTERS
Diatol*
Diethyl Carbonate
Ethyl Chloroformate
INTERMEDIATES
Acetoacetanilide
Acetoacet-ortho-chloroanilide
Acetoacet-ortho-toluidide
Acetoacet-para-chloroanilide
Ethyl Acetoacetate
Ethyl Benzoylacetate
Ethyl Sodium Oxalacetate
ETHERS
Ethyl Ether, U.S.P.
Ethyl Ether, Absolute—A.C.S.
ACETONE — A.C.S.
FEED PRODUCTS
Choline Concentrates
Curbay B-G*
DL-Methionine
Riboflavin Concentrates
Special Liquid Curbay*
U.S.I. Animal Protein Factor Supplement
Vacatone* 40
RESINS (Synthetic and Natural)
Arochem*—modified types
Arofene*—pure phenolics
Aroflat—for special flat finishes
Araplax*—alkyds and allied materials
Congo Gums—raw, fused & esterified
Ester Gums—all types
Natural Resins—all standard grades
INSECTICIDE MATERIALS
CPR Concentrates: Liquid & Dust
Piperonyl Butoxide
Piperonyl Cyclonene
Pyrenone* Concentrates: Liquid & Dust
Pyrethrum Products: Liquid & Dust
Rotenone Products: Liquid & Dust
INSECTIFUGE MATERIALS
Indalone*
Triple-Mix Repellents
OTHER PRODUCTS
Collodions
Ethylene
Nitrocellulose Solutions
PiB*—Liquid Insulation
Urethan, U.S.P.
Special Chemicals and Solvents

*Reg. U.S. Pat. Off.

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60 EAST 42ND ST., NEW YORK 17, N. Y. U.S.I. BRANCHES IN ALL PRINCIPAL CITIES

SOAP PLANT OBSERVER

By John W. McCutcheon

UNUSUAL interest of late has been shown in ethylene oxide production as evidenced by the fact that three leading chemical magazines have feature articles on it within the month—*Ind. & Eng. Chem.* 42 No. 6, 1251, "Methods of Handling"; *Chem. Eng.* 57, No. 7, 331, "A Commodity Survey," and *Chem. Ind.* 67, No. 1, 41, "A Commodity Survey."

These reports indicate production of ethylene oxide has doubled in the past two years and at present has reached a total of between 400 and 500 million pounds of which about 60-75 per cent goes into the production of anti freeze for the automobile industry. Pioneered by one company, there are at present four producing companies with two more scheduled for next year. The conclusion is reached (*Chem. Ind. Report*) that this production will be sufficient, and a possible decrease in price from about 16 cents may be expected. It is estimated that at least 20 million pounds a year of this versatile organic intermediate is at present being used in the production of surfactants and non-ionic detergents. This figure is difficult to arrive at for various reasons. First of all, because the ethylene oxide may be converted to the ethanolamines and then used either to form salts of the organic acids or salts of synthetic detergents. In the former case a true soap is formed. This may or may not be dehydrated to form substituted amides. A recent estimate (*Soap & Sanitary Chem.* 26, No. 4, Page 37) places the present annual production of alkylolamides at about 10 million pounds.

Secondly, ethylene oxide may be converted to polyglycols and these in turn used to form a wide variety of the non ionic emulsifiers, such as monoethylene glycol mono stearate, diethylene glycol monolaurate, etc. Or

the ethylene oxide itself may be condensed directly with various organic materials to form the same products. Since the handling of ethylene oxide requires special precautions (*Ind. & Eng. Chem.* 42, No. 6, 1251) it is usual for the small manufacturer to use the polyglycols for his condensation reactions. The direct use of ethylene oxide however, is to be preferred as it gives greater control over end products and is less costly.

A typical reaction of ethylene oxide with a fatty acid follows:

$$R{-}COOH + n(CH_2CH_2O) \rightarrow R{-}COO(CH_2CH_2O)_{n-1}CH_2CH_2OH.$$

If n is 12 to 15 and R is $C_{17}H_{33}$ in the above compound, the product is a detergent. The acids used may be the fatty acids, rosin acids, synthetic fatty acids, or rosin and fatty acid mixtures such as in tall oil. This last is the basis for a wide variety of non ionics used in the laundry and other trades, ("Renex," "Sterox," "Nonic 218," etc.)

Ethylene oxide also reacts equally well with an alcohol group. In this case the ester oxygen is replaced by the more stable ether one.

$$RCH_2OH + n(CH_2CH_2O \longrightarrow RCH_2O(CH_2CH_2O)_{n-1}CH_2CH_2OH$$

This leads to an interesting side development. For example, an acid may be esterified with a poly alcohol such as sorbitol and the resulting product then reacted with ethylene oxide as desired, on the free alcohol groups. An example of this may be found in the "Tween" series of emulsifiers. A different twist to this may be obtained by esterifying an hydroxylated acid such as ricinoleic with a monohydric alcohol and condensing the ethylene oxide on the fatty acid chain. Not that anything very useful has been obtained to date by this, but as the research chemist would say, "one never knows, does one!"

With alkyl phenols, such reactions produce the very useful "Igepal" class of compounds which form the basis of numerous retail liquid non-ionics, such as "Glim," "Chat," etc. Even the substituted amides as mentioned earlier, are subject to further such condensation.

Several of these classes of non-ionics show exceptional promise as competitors to the alkyl aryl sulfonate detergents. The supply and price position of ethylene oxide will have a tremendous influence on the result. For example on present prices, raw material cost of a tall oil condensed with 15 moles of the oxide would be about 12½ cents per lb. of 100 per cent active material. At a price of 12 cents for ethylene oxide, this raw material cost would drop to 10 cents. Although surfactants consume too small a proportion of the total ethylene oxide production to greatly influence its pricing at the present time, a price decline would undoubtedly have a great influence on this potential market and would tend to cushion any sharp price break that might occur.

* * *

The oversea's annual report of Nissan Chemical Industries, Ltd., of Japan has just come to hand through

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benzyl acetate

★ *Other Kay-Fries Aromatics:*

Amyl Cinnamic Aldehyde	Diethyl Phthalate	Ethyl Phenylacetate
Benzyl Acetate	Dimethyl Phthalate	Methyl Phenylacetate
Benzyl Alcohol	Methyl Acetophenone	Phenyl Ethyl Acetate
Benzyl Benzoate	Nerolin	Phenyl Ethyl Alcohol
Benzophenone	Phenylacetic Acid	Yara Yara

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KAY FRIES CHEMICALS INC.
Plant—West Haverstraw, N. Y.

the courtesy of one of the directors. This company, through its subsidiary the Nihon Yushi Co. Ltd. controls over 32 per cent of the soap and fat industry in Japan. The soap production capacity of this subsidiary alone amounts to over sixteen million pounds a month. It is interesting to note that this company produces besides soaps, fatty acids and edible oils, paints, explosives and *electric welding rods!* The following statement is quoted from the agenda sheet. "The company also directs all its activities in such a way that it will serve to promote friendly co-operation between the industrial leaders in Japan and other countries."

* * *

SAMPLES of pH paper (trade named "Lyphan") Medicina S.A. Vaduz, Liechtenstein, Switzerland, were received which differed from the usual pH papers seen in this country. Each test paper had the color range printed on its face with a center blank indicating space. In use, the entire strip is immersed and the color developed on the central area compared directly with the wet printed colors. A wide range of papers is available from 0.4 to 14.0 and in intervals of 0.3 and 0.2 pH. They do not appear to have any great advantage over those available here. Price in boxes of 200 strips varies from $2.00 to $3.00 depending on range.

* * *

FROM time to time, requests are received asking for details on making cold made soaps. Although this process is probably one of the oldest and most simple, it often proves difficult for the non technical person starting out with limited capital for equipment. The process consists essentially in mixing caustic and oil in a crutcher in such proportions that a slight excess of oil is left as a superfatting agent, allowing saponification to proceed to a point where nearly all the oil is saponified. The mixture is then dropped to a frame to complete the reaction and to allow the soap to set up. The volumes of materials should be calculated beforehand so that when all the ingredients are in and the crutcher is operating, the emulsion circulates without too much aeration. For a 60 per cent fatty acid coconut oil soap containing about two per cent superfat, the following formula will be found satisfactory.

	Pounds
Crude Manila coconut oil	566
Bleached soya bean oil	62
Caustic soda at 37.4% Na_2O	229
Water	143
Perfume	q.v.
	1000

The caustic is added slowly to the oil until the reaction sets in. Then water and caustic are alternately added and the whole crutched about 10 to 15 minutes. A few points on aeration, calculation of superfat and caustic soda will be given next month.

•

New MM&R Price List

The issuance of its price list and catalog for the third quarter of 1950 on its line of essential oils, aromatic chemicals, basic perfuming materials, flavoring products and related items was announced recently by Magnus, Mabee & Reynard, Inc., New York.

•

Water Stills Catalog

A new 16-page catalog on "Stokes Automatic Water Stills" was published recently by F. J. Stokes Machine Co., Philadelphia. The booklet describes the company's water stills for laboratory and industrial use from one-half gallon to 100 gallons per hour capacity. Copies are available on request by writing the company at 5900 Tabor Road, Philadelphia.

•

Antara Surfactant Booklet

A booklet entitled, "Antara Surfactants—What they Are—What they Do," was issued recently by Antara Products division, General Aniline & Film Corp., New York. The booklet defines surfactants (surface active agents) and soaps, illustrates and describes various applications and lists by general type (nonionics and anionics), detergents made by Antara with their various applications. Copies are available, by writing on company letterhead to Antara Products, 444 Madison Ave., New York 22, N. Y.

Water Softening Folder

Prevention of lime scale deposition by "threshold treatment" of the water with Calgon is described in a new folder recently offered by Calgon, Inc., Pittsburgh. Typical applications of threshold treatment are cited, including the prevention of lime scale deposition in boiler feed water lines, recirculating cooling systems, multiple effect evaporators and after-precipitation following lime-soda softening.

•

OPD Price Record

Publication of the "OPD Record of Prices (1950) on Chemicals and Related Materials" was announced recently by the *Oil, Paint and Drug Reporter,* New York. The book, which sells for $5, contains the entire annual review sections of the OPD for Jan. 30, 1950; Jan. 31, 1949 and Feb. 16, 1948, together with a price review from the OPD for Feb. 10, 1941. The volume is to be published annually, with the review section for the latest year replacing that of three years earlier. The 1950 review section carries all basic prices quoted in the OPD and future reviews will do the same. The 1948 and '49 reviews carried only those prices that changed during those years.

•

Sterling Motors Review

Sterling Electric Motors, Inc., Los Angeles, recently issued an eight-page, tabloid size, pictorial presentation of 70 selected applications of its motors in various industries in the United States. The newly issued photographic record includes: ideas as to application and design for products and equipment; application of modern electric power drives to new machinery installations; applications of variable speed electric power drives; applications of compact geared electric power drives at correct production speeds; old machinery, old plant operations, and processes modernized through improved applications of electric power drives.

Copies of the folder are available by writing the company at 5401 Anaheim-Telegraph Road, Los Angeles 22, Calif.

Ask yourself these questions

● *What makes red oil red?*

The answer is color bodies and other impurities which are not removed from the fatty acids by the usual processes such as distillation and filtration. These impurities not only make the Red Oil red, but they give it the strong odor usually associated with this product. In addition, these impurities make the Red Oil unstable in color when heated in processes such as esterification and saponification.

All grades of W. C. Hardesty Co., Inc., distilled Red Oil have these impurities removed in their *regular plant processing.* Our regular Red Oils are not red but amber in color with a very bland odor and maximum stability to withstand high temperatures without discoloration or oxidation. Our best salesman is a sample. Send for yours today, and compare the color with any other commercial Red Oil.

1005 Low Titre Redolene . . . . . Distilled Oleic 3-5°C Titre
1010 Redolene . . . . . Distilled Oleic 8-10°C Titre

For especially light colored products, we recommend the use of our White Oleic Acid, which is in a color class by itself.

1020 Crystolene (White Oleic Acid) 6-8°C Titre

● *Is distillation of stearic acid enough?*

Since the beginning of the fatty acid industry, producers have relied upon distillation as the means of purifying fatty acids for the production of Stearic Acid.

Distillation is not enough to remove the impurities from the fatty acids. The average commercial Stearic Acid shows this by its relatively dark color, and poor odor and color stability when it is used in making esters and high grade cosmetic soaps and creams.

The W. C. Hardesty Co., Inc., chemists have developed methods of purification of the fatty acids for Stearic Acid production which go far beyond distillation and the purity is guarded through each step in the process of manufacture. This accounts for the excellent color and odor of our Stearic Acids and for the stability of the color and odor when the Stearic Acids are processed in customers' plants.

To produce highest quality esters, soaps and cosmetic preparations, use our Stearic Acids . . . generous testing samples will show you why.

1210 Single Pressed Stearic Acid
1220 Double Pressed Stearic Acid
1230 Triple Pressed Stearic Acid
1240 Supra Grade Stearic Acid

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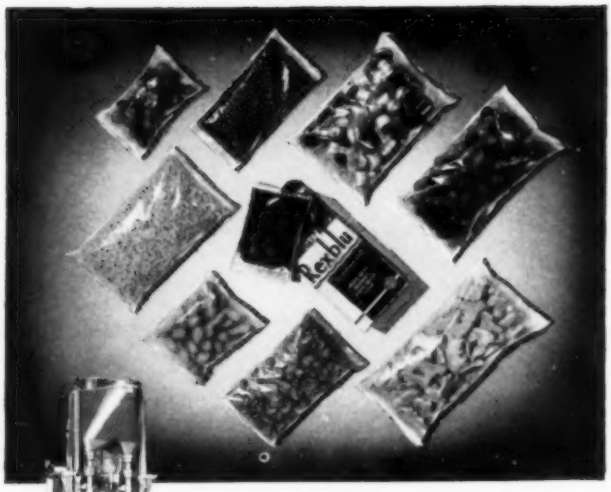

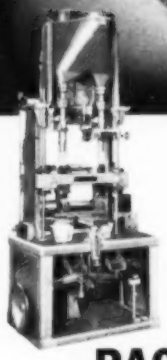

POLYETHYLENE PACKAGES ON STOKESWRAP PACKAGING MACHINES

Some of the products particularly suited for packaging in Polyethylene film are the following:

- Soap powders
- Bleach and Chemical powders
- Liquids
- Syrups
- Creams and pastes
- Small metal parts
- Air rifle shot
- Ball bearings and hardware
- Marbles
- Frozen foods
- Nuts and hard candies
- Dehydrated products
- Hygroscopic products
- Powdered milk products

The Stokeswrap Automatic Packaging Machine has been produced for a number of years for handling various heat sealing films, such as Cellophane, Pliofilm, heat sealing foil, heat sealing papers, etc., and the new machines are now equipped to handle Polyethylene film, either printed or unprinted. Use of Polyethylene films give a stronger package, allowing heavier weights of products to be handled and also giving added protection for many products which heretofore could not be packaged in flexible packages.

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Subsidiary of Food and Chemical Corporation
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fmc
Exclusive West Coast Distributor
Anderson-Barngrover Division of FMC
San Jose 5, California

NEW PATENTS

The information below is furnished by patent law offices of

LANCASTER, ALLWINE & ROMMEL

402 Bowen Building
Washington 5, D. C.

The data listed below is only a brief review of recently issued pertinent patents obtained by various U. S. Patent Office registered attorneys for manufacturers and/or inventors. Complete copies may be obtained direct from Lancaster, Allwine & Rommel by sending 50c for each copy desired. They will be pleased to give you free preliminary patent advice.

No. 2,507,184, Alkali-Refining of Fatty Glycerides in the Presence of an Inorganic Phosphate Compound, patented by S. Jack Rini, Winchester, Mass., assignor to Lever Brothers Company, Cambridge, Mass., a corporation of Maine. In a process of alkali-refining a fatty glyceride stock by treatment with aqueous alkali, as the essential neutralizing agent for free fatty acids in the stock and separating an aqueous phase containing undesirable impurities and a refined oil phase, the improvement which comprises having present in the refining mixture a small amount up to about 0.75 per cent of an inorganic phosphate compound to reduce the refining losses is patented.

No. 2,507,208, Compositions Comprising Halogenated Cyclo-Diene Quinone Adducts, patented by Julius Hyman, Chicago, Ill. The patent covers the product obtained by chlorinating an adduct resulting from the addition of two mols of cyclopentadiene to one mol of benzoquinone dissolved in carbon tetrachloride at temperatures below 10° C. until the system no longer gains in weight.

No. 2,509,764, Insecticide Composition, patented by Gerarda Francisca Elisa Maria Dierick, Amsterdam, Netherlands, assignor to Shell Development Company, San Francisco, Calif., a corporation of Delaware. An insect control composition is described comprising an inert vehicle and dispersed therein at least two active ingredients, one being a dinitromethylphenol and another being the salt of a dinitromethylphenol and ammonia, the ratio of said ingredients being between 1-4-and about 3:2 said ingredients being present in amounts sufficient to render said compositions toxic to insect life.

No. 2,507,236, Germicidal Solution, patented by John S. Williams, Lancaster, Pa. A germicide suitable for application to the skin of living humans and for sterilizing surgical instruments, is covered which comprises the following:

Sodium hexametaphosphate	1
Sodium citrate	about 7
Sodium carbonate	about 10
Paraformaldehyde	about 10
Sulphonated castor oil, free from sulphuric acid	about 10

Such components all being dissolved in about 62 parts of water and such composition being free from methanol and free from phenolic bodies.

No. 2,507,237, Process of Treating Crude Sulfate Soap Skimmings, patented by Clarence B. F. Young and Edward J. Calleton, Leonia, N. J.,

EXQUISITE FLORALS FOR SOAPS

Apple Blossom	Honeysuckle	Rose
Carnation	Hyacinth	Sweet Pea
Clover	Jasmin	Syringa
Fougere	Lavender	Verbena
Gardenia	Lilac	Violet
Geranium	Lily of the Valley	Wisteria

Samples and quotations upon request—

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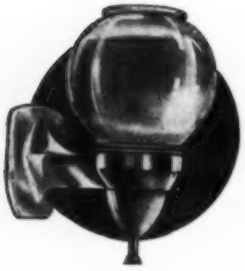

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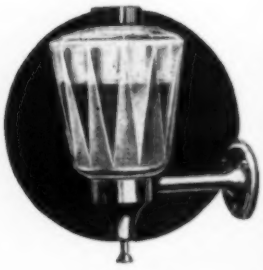

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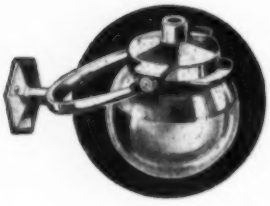

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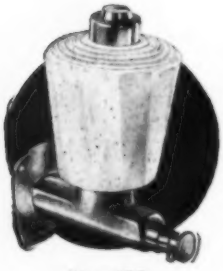

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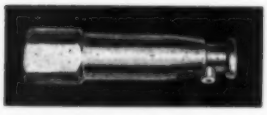


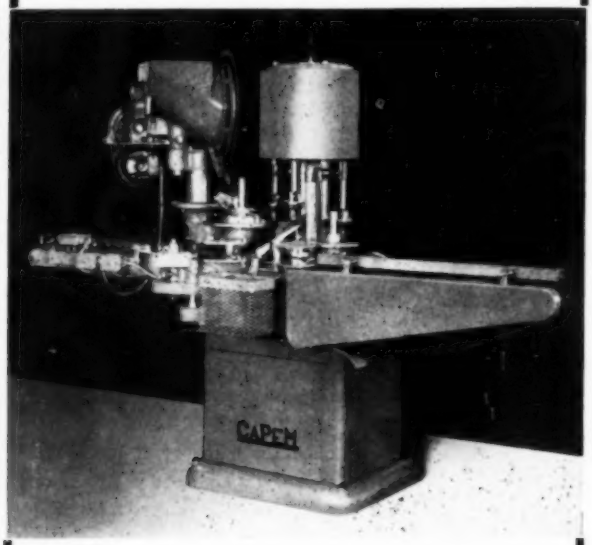
No. 600

No. 650

MOORE BROS. COMPANY
100 WARREN ST.,
NEW YORK 7, N.Y.

CAPEM

THE MODERN SCREW CAPPER



- Applies any type of standard screw cap or cover at speeds of 2000 tc 10000 per hour.
- Takes container from conveyor line, applies cap perfectly, and returns container to conveyor AUTOMATICALLY without intermediate handling.
- Handles bottles, jars, cans or jugs of any size or shape.
- Delivers a perfect, LEAKPROOF seal at low cost.
- Available in 1, 2, 4, 6 and 8 spindle models.

Write for prices and delivery.

CONSOLIDATED PACKAGING MACHINERY CORP.
BUFFALO 13, N.Y.

assignors to National Southern Products Corporation, New York, N. Y., a corporation of Delaware. The patent covers a method for the direct production of a purified soap powder from liquid crude sulphate soap skimmings obtained from black liquor which comprises spray-drying said liquid soap skimmings by atomizing the same into an atmosphere of air heated to a temperature from about 400° F. to about 700° F. to form a soap powder having not more than about 10 per cent of moisture and to transform ill-smelting ingredients in said soap skimmings to volatile compounds of relatively inoffensive odor taken up by the said atmosphere and separating the resulting soap powder from the said atmosphere while in a heated condition to retain the moisture therein.

No. 2,505,338, Refining Fatty Oils, patented by George H. Palmer, Fanwood, N. J., assignor to The M. W. Kellogg Company, Jersey City, N. J., a corporation of Delaware. The patent covers a method for refining a fatty oil which comprises introducing said oil into a solvent extraction zone wherein said oil is contacted with a solvent for said oil which solvent is relatively volatile having a critical temperature not substantially higher than 450° F., maintaining the temperature in said extraction zone above the temperature of maximum solubility of the oil in the solvent and under a pressure effective to maintain the solvent substantially entirely in the liquid condition in the extraction zone, regulating the conditions of temperature and pressure in said extraction zone to form an extract phase containing a major proportion of said fatty oil and a raffinate phase containing a minor proportion of said fatty oil including a concentration of the color bodies of said oil, separately withdrawing said extract and raffinate phases from said extraction zone, continuously passing a stream of said solvent in liquid condition upwardly in an elongated solvent fractionation zone from a lower solvent inlet to an upper extract phase outlet, introducing into said fractionation zone extract oil comprising at least a portion of the oil separated from said fatty oil by said extraction zone including at least a portion of the most soluble components of said fatty oil, introducing said extract oil into said fractionation zone and into contact with said solvent stream at a point below said extract phase outlet and substantially higher than said solvent inlet to form separate counter-flowing extract and raffinate phases, maintaining the lowest temperature in said fractionation zone above the temperature of maximum solubility of said extract oil in said solvent and applying sufficient pressure to said fractionation zone to maintain the solvent therein substantially entirely in the liquid condition, regulating temperature and pressure and the solvent: oil ratio in said fractionation zone to form a raffinate phase in the bottom thereof comprising oil equivalent to at least a major portion of said extract oil charged to said fractionation zone and to form an extract phase containing a portion of the extract oil charged to the fractionation zone, separately withdrawing said extract and raffinate phases from said fractionation zone, treating a portion of said last-mentioned withdrawn extract phase to recover solvent and a product oil fraction therefrom, segregating another portion of said last-mentioned withdrawn extract phase and adjusting the temperature and pressure thereof to a condition of greater solubility of said solvent and said fatty oil, and introducing said segregated portion of extract phase into said extraction zone to supply thereto at least a major portion of the solvent required in the said extraction treatment in said zone.

Smelser on Advtg. Unit Bd.

D. P. Smelser of Procter & Gamble Co., Cincinnati, was elected recently a director of the board of the Advertising Research Foundation.

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Distilled red oil. Almost colorless. F.F.A. 98-100%. Meets or exceeds U.S.P. specifications.
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May be used alone or compounded to form household and industrial detergents.
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Court Rules on G-11 Soap

The patentability of a soap rendered germicidal by the incorporation of small amounts of certain phenolic germicides was upheld recently by the U. S. Court of Customs and Patent Appeals, Washington, D. C. The Court reversed the Patent Office and held that the finding of Drs. Eric C. Kunz and William S. Gump of Givaudan-Delawanna, Inc., New York, covering the use of "G-11" in soap can be patented.

The Patent Office in refusing to allow a patent, held that since the fact that the use of mercurials renders soap germicidal was previously known, and since others had incorporated phenols in soaps, there was no invention in making soap germicidal by incorporating therein the 2,2′-dihydroxy halogenated diphenyl methanes.

The Court disagreed with the Patent Office, holding that the mercurials are quite different from the phenols, and that mercury soaps are not suitable for the same purposes as the Kunz and Gump soaps, which can be used like ordinary soap. The Court stated that Drs. Kunz and Gump had produced an entirely new and very useful composition of matter. It further held that not only was a useful soap composition produced by the inventors, but the soap was one which had long been desired, i.e., people had tried without success for some time to make soap germicidal by incorporating in it phenols.

Taylor Joins M.C.A.

The appointment of Robert L. Taylor as executive vice-president of the Manufacturing Chemists Assn., Washington, D. C., was announced recently. He is the former editor of *Chemical Industries*, which was sold Aug. 1, by MacLean Hunter Publishing Corp., New York, to McGraw-Hill Publishing Co., New York.

Mr. Taylor will make his headquarters at new M.C.A. offices to be opened early in the fall in New York. He is a former advertising manager of Monsanto Chemical Co., St. Louis.

No final decision on the proposed merger of M.C.A. and the Synthetic Organic Chemical Manufacturers Assn., following discussion at the recent joint meeting of the two groups has been made as yet.

SOCMA Meeting Dates

Fall meeting dates for the Synthetic Organic Chemical Manufacturers Association, announced recently, are to be held on the following Wednesdays: Sept. 13, Oct. 11, Nov. 8 and Dec. 13, which is to be the annual dinner meeting. The three previous meetings are luncheon gatherings. All meetings will be held at the Hotel Commodore, New York.

Mathieson Earnings Rise

Net earnings for the six months ended June 30, 1950, the highest for any similar period in the 58-year history of the company, rose to $4,410,-084, equal to $3.25 per common share, as compared with $3,365,819, equal to $2.47 per common share in the comparable period in 1949, it was reported recently by Mathieson Chemical Corp., Baltimore.

Chem. Salesmen Golf

The August 16 golf outing of the Salesmen's Association of the American Chemical Industry is to be held at Montclair Golf Club, Montclair, N. J. The final tournament of the season is scheduled for Westchester Country Club, Rye, N. Y., Tuesday, Sept. 12.

Richey in Detrex Post

Phil H. Richey was recently appointed personnel director of Detrex Corp., Detroit, Mich.

Cellulose Derivatives

(*From Page 32*)

cellulose derivative was used in the soap-containing synthetic detergent bar developed during the war. As reported by McDonald (34), the incorporation of a suitable ethyl cellulose ether binder in the detergent mixture increased by 30 per cent its abillity to lather in water of hardness up to 300 parts per million.

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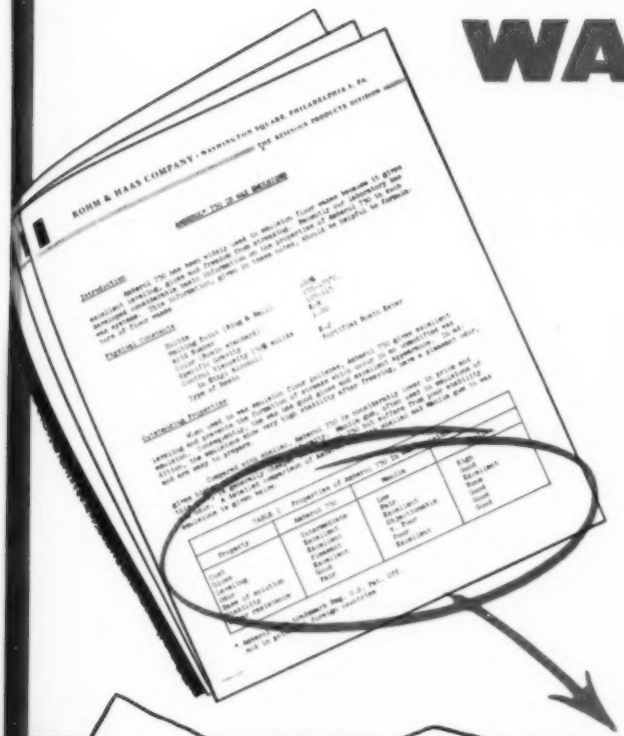

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Cost	Intermediate	Low	High
Gloss	Excellent	Fair	Good
Leveling	Excellent	Excellent	Excellent
Odor	Pleasant	Objectionable	None
Ease of solution	Excellent	V. Poor	Good
Stability	Good	Poor	Good
Water resistance	Fair	Excellent	Good

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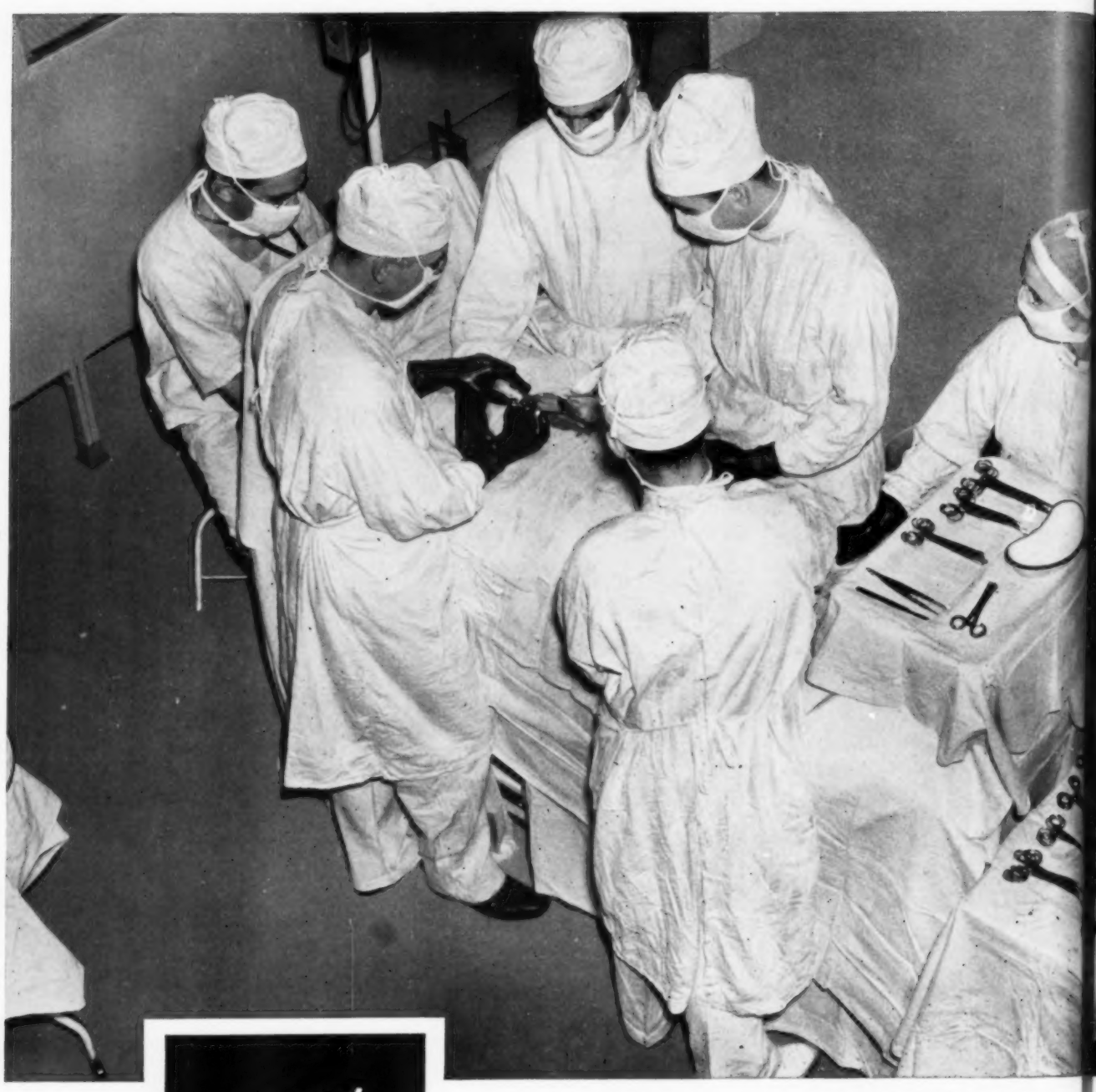

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DETHMOR.. is formulated from warfarin (newly coined common name for Compound 42) under precise laboratory control. Mix 19 parts bait with 1 part Dethmor, and 85% to 90% control may be expected.

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Actual Tests Prove About 90% of Cleaning...to Dry and Return as

According to comprehensive studies made in past years 85% to 90% of bacteria are found on floor surfaces — the other 10% or 15% remains air-borne. Destroying this 90% portion of bacteria usually found on floors will greatly reduce the hazard of infection from germ life that is scuffed or blown into the atmosphere in the form of dry dust. Of course, all of the bacteria on floor surfaces are not pathogenic or disease producers — on the other hand the dirt and dust on the floor holds bacteria causing such diseases as pneumonia, diphtheria, dysentery and other organisms of the Staphylococcus group causing boils, pus formation, etc.

SAN-I-SUDS

The average person does not usually concern himself with germs. It is human nature to ignore anything that cannot be seen, smelled or heard. If bacteria were as large as bedbugs and millions of them could be seen crawling over the floor surface every effort possible would be made to eliminate these creatures. The large proportion of bacteria on the floor definitely presents a serious health hazard even though unseen by the naked eye!

THIS REVOLUTIONARY NEW "CLEANER-SANITIZER" COMPLETELY DESTROYS THIS LARGE PROPORTION OF GERM LIFE ON FLOOR SURFACES!!

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The matter boils down to a simple question. "If floors are going to be cleaned anyway why not free them of germs at the same time?" The use of this marvelous cleaner-sanitizer results in spotlessly clean floors — completely free of germ life — thereby eliminating the major source of contagious disease contracted from bacteria contained in dust particles scuffed or blown into the atmosphere.

SAN-I-SUDS

It is common practice in some institutions to clean the floor and then afterwards rinse with a disinfectant solution. Other users put a small amount of disinfectant in the scrub solution when mopping or cleaning floors. There is no assurance, however, that the disinfectant in the scrub solution is acting as a germ killer. Usually the scrub solution counteracts the germicide rendering it useless.

Using this new cleaner-sanitizer, it is not necessary to follow the cleaning procedure with a disinfectant rinse! Neither is it necessary to add disinfectant to the scrub solution! This truly wonderful product cleans — disinfects — deodorizes all in one single operation!

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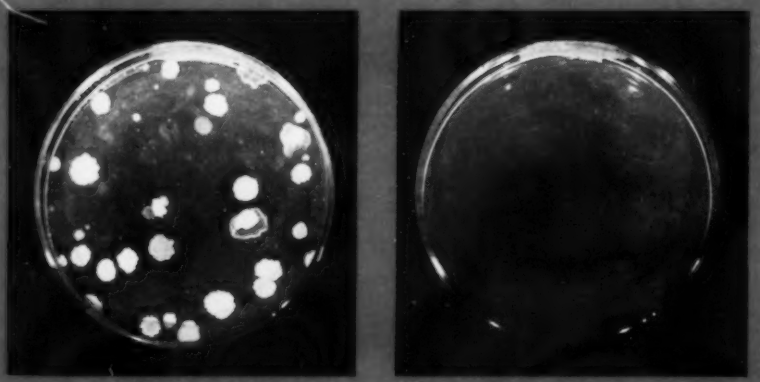
Beyond a question of a doubt this cleaner-sanitizer offers the user of floor cleaners the finest quality product ever obtainable. It will outperform any other cleaner regardless of the basis of comparison. It cleans fast, it cleans better. *It deodorizes* whereas other cleaners do not. It disinfects whereas other cleaners do not. It sanitizes, other cleaners do not.



COMPARE THESE UN-RETOUCHED PHOTOS

The plate above shows colonies of bacteria containing millions of germs. Only a few drops taken from a pail of ordinary scrub solution were plated and it is obvious that the scrub solution is literally teeming with live and potentially dangerous bacteria.

This plate contains a few drops of solution taken from a pail in which this marvelous new cleaner-sanitizer was used and the complete absence of bacteria proves its amazing germ-killing power.

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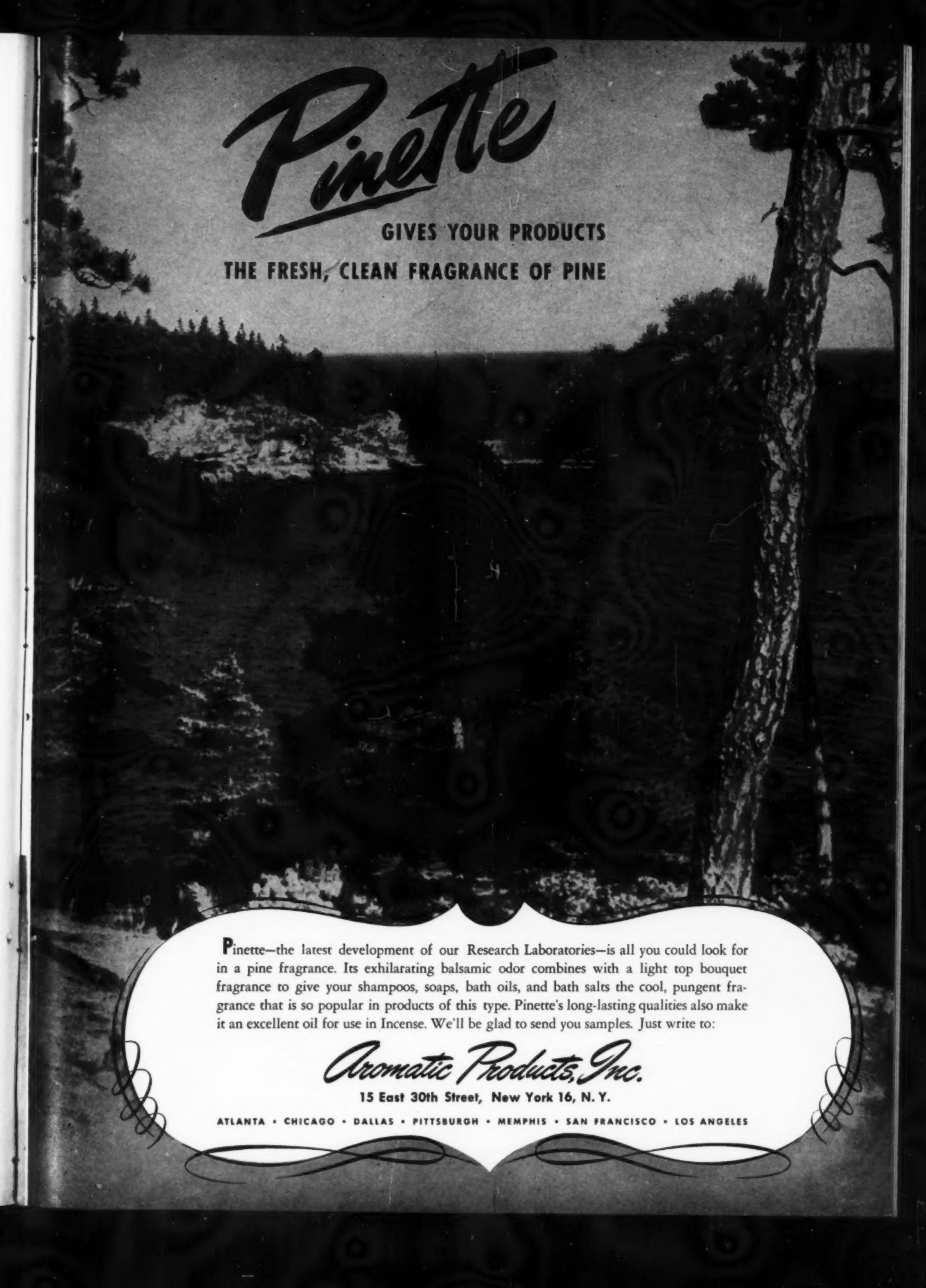

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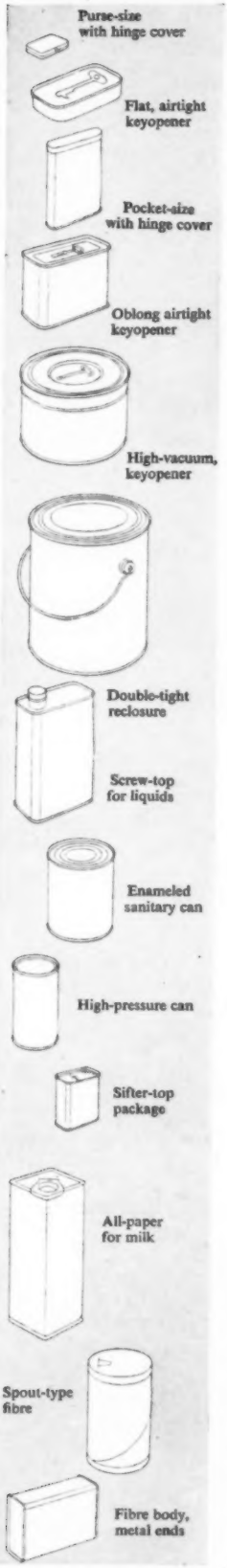

Architecture of the enameled sanitary tin can

The Side Seam—The edges of the can body are first hooked and then bumped or flattened together. Then final sealing is accomplished by soldering the outside of the side seam.
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You can pack it under high-heat or low-cold. You can lithograph it in handsome, come-hither designs.

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SANITARY PRODUCTS
A SECTION OF SOAP

ALTHOUGH the shakeup in personnel of the Federal Trade Commission may have postponed the issuance of trade practice rules for the floor wax industry, it now seems that such rules eventually will be issued. Whether or not there is need for industry trade practice rules has been and is being hotly debated in and out of the presence of F.T.C. representatives.

Following preliminary industry discussions last month, an industry committee meeting on the proposed rules will take place in Washington next month. It is expected that later in the year a general meeting of all interested parties will be held with F.T.C. officials presiding.

The postponement in the adoption of the rules proposed earlier may have been fortunate for manufacturers in that the Commission as presently constituted is purported to be somewhat more understanding of the problems of business.

AS far as the manufacturer of household insecticides is concerned, the 1950 summer season is about over. All told, it has not been too bad a season, according to reports. The real problem, however, will arise a month or so hence when manufacturers enter the market to cover their 1951 needs of DDT and other insecticide raw materials. DDT is scarce and is likely to become scarcer. All manufacturers of DDT and other chlorinated products are far behind on deliveries and anticipate no relief from this situation for several months, if then.

Not only has demand been heavy, but the shortage of chlorine has reduced DDT output well below the six - and - a - half million pound monthly average of last April and May. Even settlement of the strikes at the plants of two of the largest producers of chlorine cannot bring back the much-needed production which was lost. A continued shortage of DDT will tend to throw demand in greater proportion on other insecticide materials with a tightening of these markets.

Even if widespread war-scare buying had not stampeded all markets to some extent, the insecticide raw material situation could cause concern to buyers. As things in general have turned out, the 1951 supply picture is not bright, something which should induce insecticide manufacturers to cover requirements, if and when such can be covered for future delivery, as early as possible.

TRAINING of sanitary supply salesmen has been one of the tough problems facing jobbers and distributors during the postwar period. The number and variety of equipment and supplies carried by the average jobber, to say nothing of the application and use of these items, make learning the sanitary supply business a difficult assignment. As a result, most salesmen hit merely the high spots, pushing a few items that sell well, neglecting the rest. When the going got tougher, profits began to shrink for the men who did not know their lines well. Complaints were frequent and employers began to see the need for more training.

In addition to the efforts of the National Sanitary Supply Association in supplying sales training bulletins, films and similar presentations, there seems to be a growing custom among distributors to bring their salesmen to regional sanitary supply meetings at which educational films or discussions are presented. Not only has the training of salesmen in the field been aided, but their morale has shown marked improvement.

ALLETHRIN

General Nature of Allethrin

By Dr. R. W. McNamee
Carbide and Carbon Chemicals Division
Union Carbide and Carbon Corporation

ONE of the principal jobs remaining to be done in connection with the successful commercialization of allethrin is to define it, and, as a preliminary step toward doing this, we must recognize it as a synthetic organic chemical. It is not an extract of a natural product and does not contain a multiplicity of extraneous and nondescript contaminants; it is a relatively pure substance. Accordingly, a method of definition should be suggested if we examine the procedures now used for specifying other high-quality, synthetic organic chemicals.

We have been manufacturing and marketing synthetic organic chemicals of varying degrees of molecular complexity for a number of years—and allyl cinerin is neither the most complex nor the simplest with which we have had to deal. I think it would be useful at this point to summarize the pertinent facts we have concerning its physical and chemical properties.

Allyl cinerin is a fairly high-boiling ester with a simple elemental analysis—carbon, hydrogen and oxygen. Its molecular weight is both easy to calculate and easy to determine. Like other synthetic, organic chemicals it can be rather closely specified by reference to physical characteristics such as solubilities in useful solvents, specific gravity, and refractive index. It has the chemical attributes of an ester, a ketone, an alcohol and an unsaturated hydrocarbon. In addition, it has the quality of absorbing certain light frequencies in a unique combination of ways. It would seem that, if we had pure allyl cinerin in hand, there would be no difficulty in analyzing it. This is so. We believe that reliable and precise chemical and physical measurements are available for the purpose.

At present, commercial allyl cinerin is not 100 per cent material. A small quantity, perhaps 10 per cent, of other simpler chemicals are contained. These impurities interfere with some of the chemical determinations and tend to vitiate the quantitative results of the analyses. Hence, it is incumbent upon us to do one or both of the following:—

1. Produce a material containing so little of the impurities that the chemical methods can be applied without regard to the interfering materials. This is not necessarily impractical.
2. Characterize the impurities precisely so that they can be determined quantitatively in order to arrive at the proper assay of a sample of allyl cinerin. This we are doing.

Now to be more specific about the present commercial allyl cinerin. What is it like and what certain knowledge do we possess concerning its physical and chemical properties? It is a clear liquid with a specific gravity of 1.005 at 20° C. and a refractive index of 1.5040 at 20° C. It is completely miscible with petroleum distillates ordinarily employed in the formulation of insecticidal sprays. The color of the solution is very light. Less than 0.1 per cent of this product is insoluble in the "Freon" used in aerosols. Moreover, it stays that way in storage and does not develop polymers and gunks which clog orifices.

With regard to allyl cinerin assay there is not yet any final agreement between the several interested parties, i.e., our customers, the Department of Agriculture, and ourselves, concerning the best method of analysis. Based on careful and continuing studies of analytical methods involving relatively large-scale molecular distillation, chemical analyses, and bio-assay, we believe the present commercial material to contain about 92 per cent allyl cinerin. It may be necessary to revise this figure when the results of current studies are available and it is quite probable that future production will be of an even higher quality.

A round-up of recent information dealing with problems in the handling and use, as well as tests on the effectiveness and toxicity of the synthesized allyl homolog of cinerin I.

* Presented before Mid-Year meeting Chemical Specialties Manufacturers Assn., Chicago, June 13, 1950.

SYMPOSIUM*

Standardization, Analysis and Storage of Allethrin

By J. B. Moore
McLaughlin Gormley King Co.

THE currently used methods of analysis for standardization of pyrethrum products can be used in the analysis of allethrin even though we know they are not perfect. At first it would seem that the Seil and the mercury reduction method should give better and more reliable results with allethrin, supposed to be a pure chemical, than with the natural product, which is well known to be composed of four biologically active constituents.

As most of you know, the Seil method measures the acid components of the four esters of natural pyrethrum. We also know that some of the allethrin products, of which most of us have already seen commercial samples of various brands, contain some free acid; that is, free, unreacted chrysanthemum acid and its chloride; the latter being converted, of course, into acid during the Seil procedure. Consequently, the Seil method will give values for biologically active material that are slightly too high by the presence of a few per cent of free acid in the allethrin.

For this same reason we have suspended working on the method using the absorption of iodine, although we had already determined that only the unsaturated linkage in the acid radical and that in the allyl chain of the cinerolone react. The double linkage in the nucleus of the cinerolone, however, does not react with the iodine. It was originally hoped that this method would avoid the long time required by the Seil method.

We may conclude from these errors that methods measuring the acid components would not be suitable for allethrin. We can then turn to methods for measuring the alcoholic component of the ester; that is, any reactive group in the cinerolone radical such as its keto group. This can be done by the mercury reduction method or any other method based on the direct or indirect reduction of the metal compounds by the said group. The results, however, gave uniformly a somewhat higher value than the Seil method. This was not very surprising with the first batches of allethrin as they were found to contain small amounts of extraneous reducing substances. However, these higher values occur also to some degree with products which can be assumed to be reasonably free from the extraneous reducing substances. It may, therefore, be assumed that such substances are formed during the course of analysis as is the case in the analysis of different sugars by the Bertrand method, thus necessitating the long differential tables used for each individual sugar. This extremely tedious work has not yet been undertaken to our knowledge with allethrin purified by several precipitations and purifications of the semicarbazone. It seems doubtful whether it is worthwhile to add this to the already lengthy and time-consuming mercury reduction method.

We believe that less time-consuming methods may eventually be developed to give a reasonably satisfactory analysis. We have done some work recently on a method in which the keto group of the cinerolone is reacted with hydroxylamine and the excess of the hydroxylamine is then determined by measuring its reducing effect on polyvalent metals such as ferric chloride, either by titration or colorimetrically. This method was suggested at Columbia University in connection with the checking of possible effects on choline esterase by pyrethrins, allethrin, and the synergist "264." This method looks rather attractive as the whole determination may be finished in about one hour if the standardized solutions are on hand. With this method, no reducing substances can be formed in the basic reaction between the cinerolone group and the hydroxylamine. Errors could occur only from reducing substances in the original allethrin. There still remains a lot of work to be done in eliminating all possible sources of error in this method and we are not yet ready to give any particulars but will inform all interested parties as soon as we have finished.

Another possible method exists in the hydrogenolysis of allethrin as suggested by Drs. Haller, LaForge and Acree of the Bureau of Entomology between 1937 and 1941 as a possibility for an analysis of pyrethrins. This is a rather short and simple procedure. The aliphatic double linkages of the pyrethrins or allethrin are saturated with hydrogen and the ester group is cleaved at the same time. If the allethrin contains small quantities of free chrysanthemum acid, this should be verified separately by titration, and the amount so determined

should be deducted from the total.

The standardization of allethrin, therefore, will have to wait the adoption of an accurate reproducible analytical method. Thereafter the material should be standardized at practical levels, depending on the purpose for which the product is intended; that is, at the highest possible manufactured concentration and at various lower commercial concentrations most convenient for the consumer. At present, the various samples of commercially produced allethrin in the most concentrated form vary between 80 per cent and 93 per cent when tested by the Seil method. Hence standardization of strength is urgent.

There should also be some specifications regarding the color of the material. Commercial samples at present vary from a Gardner scale number of about 10 up to 17, the latter being too dark for certain purposes in which residues may show on light colored material such as felt, wool, etc.

The storage requirements for allethrin do not seem particularly strenuous after our experience with pyrethrins. We have run a number of experiments designed to reach values parallel to the concept of this atomic age to the half life of radioactive materials. Air alone in the dark if not continuously blown through allethrin or solutions thereof has little effect upon allethrin. Heat in the dark has a substantial effect above 65° C.: a half life was reached upon 18 hours exposure in the dark at 95-96° C. which is a trace better than with pyrethrins. The question of the effect of ultraviolet rays is of lesser importance for storage since the material would be normally kept in either metal containers or in glass, both of which give protection against ultraviolet radiation. We have run a series of tests with pyrethrins and allethrin at comparable concentrations. The results of these tests indicate that at higher concentrations the allethrin is somewhat more stable than pyrethrins. Very dilute solutions, such as two per cent solutions, have shown about equal stability.

In conclusion I would like to say that we feel that the definition of allethrin should mean 100 per cent material or 100 per cent of the allyl analog of cinerin I. Then all concentrations of allethrin, whether it be in fly sprays, agricultural dusts, or aerosols, could be stated as so many per cent allethrin in the same manner as the labeling of pyrethrin formulations.

Toxicity of Allethrin to Rats

By Donald F. Starr and Paul Ferguson
S. B. Penick and Co.
and Theodora N. Salmon
Hunter College

SOME chronic toxicity tests with allethrin (previously referred to as a synthetic pyrethrin) on white rats were described in *Soap and Sanitary Chemicals* for March 1950. These studies have been continued and extended. The following account is a summary of the experiments.

Chronic Feeding Tests

CHRONIC feeding of allethrin was started as soon as a sample approximating commercial production was available, on August 19, 1949. Six rats (three males and three females) have been maintained on a diet of prepared dog-food with 0.2 per cent of allethrin mixed in. The dosage of allethrin approximates 200 mg. per kg. per day. After a period of 41 weeks all six rats are in good condition with body weight equal to controls. All female rats have given birth to at least two normal litters.

Both second and third generation rats were fed the 0.2 per cent allethrin diet in the laboratory as soon as they were able to take solid food. The young rats grew about the same as the control rats. A total of 50 second and third generation rats have grown to maturity. Several of the animals have been sacrificed for the examination of their internal organs but otherwise there have been no deaths among the experimental animals.

Aerosol Inhalation Tests

SINCE the highest quality aerosol formulations may be made using allethrin as an ingredient these tests are believed to be especially significant. Chronic aerosol inhalation tests were started September 6, 1949 using 20 rats. The aerosol formula 100 was:

Per Cent	
1	Allethrin
9	Petroleum Distillate (Bayol D)
45	Freon 11
45	Freon 12

The allethrin was used at a high concentration to make a severe test but as a practical insecticide it may be used at only about one-half or one-fifth of this concentration.

The rats were sprayed with 800 g. per 1000 cubic feet and exposed 30 minutes per day six days a week in their regular cages. Their food was also sprayed. In such a treatment the rats not only inhaled some of the insecticide aerosol particles but the eyes, ears and other sensitive parts of the body were partially wetted with allethrin. Appreciable quantities were taken orally as the rats cleaned themselves and as they fed on a diet contaminated with allethrin.

During a period of 39 weeks none of the experimental rats have been harmed by the allethrin aerosol. Growth rates and reproduction have been normal.

A total of 48 new-born rats have been included in the aerosol inhalation tests. Second and third generation rats were exposed to allethrin residues from the day they were born. They were sprayed with the allethrin aerosol the same as the parent rats. In spite of the delicate condition of newborn rats there was no sign of irritation and their growth rates were equal to controls. Reproduction from second generation rats was normal. Third generation rats have not yet been mated.

Since allethrin in practical aero-

sol formulations will probably be used in combination with other insecticides it is particularly important to study some of these mixtures. The aerosol formulation 105 containing:

Per Cent	
1	Allethrin
5	Sulfox-cide
4	Petroleum distillate (Ultrasene)
45	Freon 11
45	Freon 12

was studied to test the toxicological effect of the presence of a synergist. The spraying procedure was the same as that described previously except that 1600 g. per 1000 cubic feet were tested in addition to the 800 g. exposure. There were no deaths out of eight rats in seven weeks and weight gains were normal.

In an unpublished report, Dr. Charles P. Carpenter and others of the Mellon Institute described the testing of massive doses of one per cent allethrin aerosols on 30 rats. Dosages were 16,700, 16,800 and 18,200 g. per 1000 cubic feet with 30 minute exposure periods. All the rats survived and gained weight normally during a two weeks observation period.

A similar technique was used in testing the following aerosol formula 0.321:

Per Cent	
0.3	Allethrin
2.0	DDT
1.0	n-propyl isome
6.0	Velsicol AR50
5.7	Bayol D
42.5	Freon 11
42.5	Freon 12

Three rats were exposed for 30 minutes to a dosage of 24,200 g. of the aerosol per 1000 cubic feet. At the end of the 30 minute exposure period the rats were wet with the oily insecticide mixture. They were partially anesthetized when they were removed from the chamber, which was not surprising since there were enough "Freon" gases released to more than displace all the air in the chamber. The rats recovered quickly and appeared normal in every way all during the two weeks of observation after the treatment.

The combination of allethrin, DDT and the synergist n-propyl isome was non-toxic in a single enormous dose.

Pathological Examinations

A TOTAL of 40 rats which were representative of the experimental animals exposed to allethrin in the diet or aerosol were sacrificed at various times from one to eight months after the start of the experiments. Autopsy showed no visible damage or gross pathology in any of the internal organs.

Microscopic examination of the organs was made. In none of the experimental animals was any abnormality found which could be correlated with the insecticide treatments.

Conclusion

THE evidence which has accumulated indicates that both newborn and adult rats can tolerate allethrin over long periods of time in amounts of about 100 times that which would be encountered by normal insecticide usage. So far there has been no indication that combinations of allethrin with other insecticide materials such as DDT or the synergists, "Isome" or "Sulfox-cide" present any unexpected problems. The most extreme misuse of allethrin aerosol bombs has not killed any of the exposed rats.

Dr. S. A. Rohwer, assistant chief, B.E.P.Q., U.S.D.A., has indicated that the toxicological work that has been done with the first commercial lots of allethrin is sufficient to warrant the approval of the U. S. Department of Agriculture for the use of allethrin in aerosols. Approval will be granted for the manufacture of 20,000 units of certain selected aerosol formulas to test the consumer acceptance of allethrin aerosols. The problem remaining is not the health hazard but the lack of methods of analysis and standardization of commercial allethrin.

Allethrin with Synergists

By Howard A. Jones, H. O. Schroeder and H. H. Incho

Research and Development Laboratories
U. S. Industrial Chemicals, Inc.

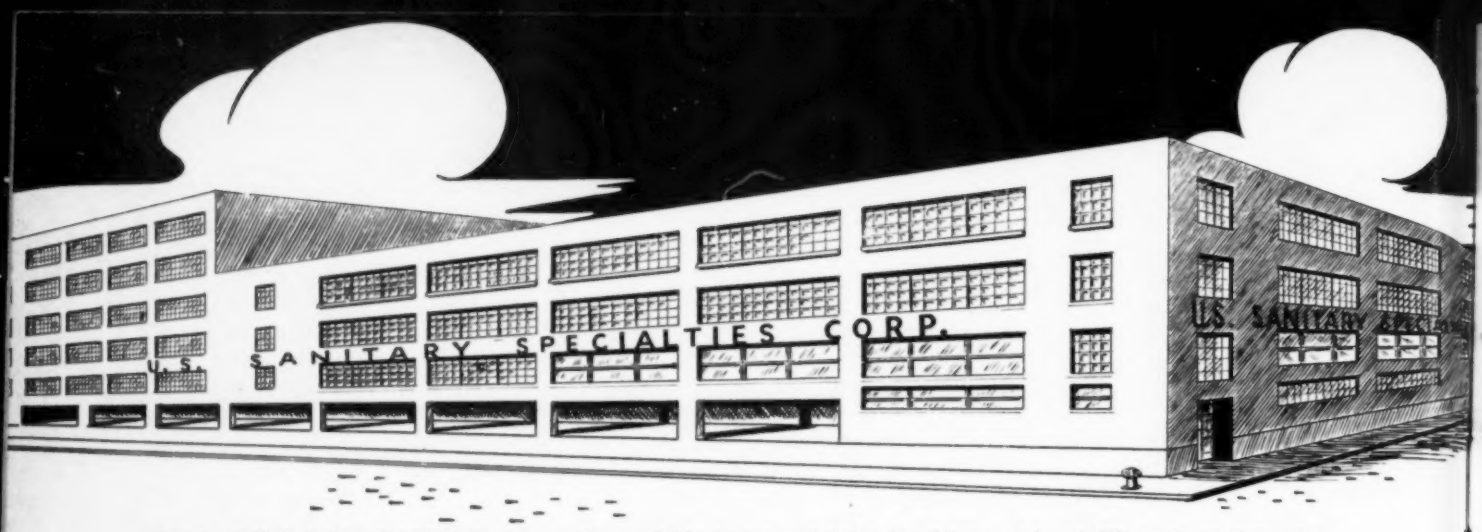
ALLETHRIN, the synthetic allyl homolog of one of the constituents of pyrethrum, has been shown by Stoddard and Dove (1) to differ from natural pyrethrins in effectiveness against certain insects when used without synergists. Since almost all users of pyrethrum, for economic reasons, employ synergists, the action of such materials with allethrin becomes an important consideration.

In this short presentation it will be possible to give results of only a limited number of tests of allethrin with synergists against house flies and roaches, and to refer briefly to results on a few other insects. The data presented must be considered as preliminary in nature, and any conclusions drawn from the results should be considered as tentative rather than final. The thorough study of the synergism of a particular compound is a long range problem, and must include a broad range of ratios and concentrations as well as tests against a wide variety of insects.

House Flies

IN the first study, four synergists, n-propyl isome, synergist 264, sesame oil extractives and piperonyl butoxide were tested in combination with allethrin and with natural pyrethrins as space sprays against house flies by the Peet-Grady method. The tests included only one ratio of each synergist with allethrin or pyrethrins, the ratio suggested for these tests by the supplier of the synergist. These tests were not designed to compare the relative efficiencies of the synergists

(*Turn to page* 133)



Exterior of U. S. Sanitary Specialties Corp's. new plant at California Ave. and Taylor St., Chicago. It has 42,000 sq. ft. of floor space.

New U. S. Sanitary Specialties

By Dr. E. G. Thomssen

THE recent opening of the new plant of U. S. Sanitary Specialties Corp., in Chicago marks another great advance in the company's progress since its founding by Harold I. Koppelman in 1917.

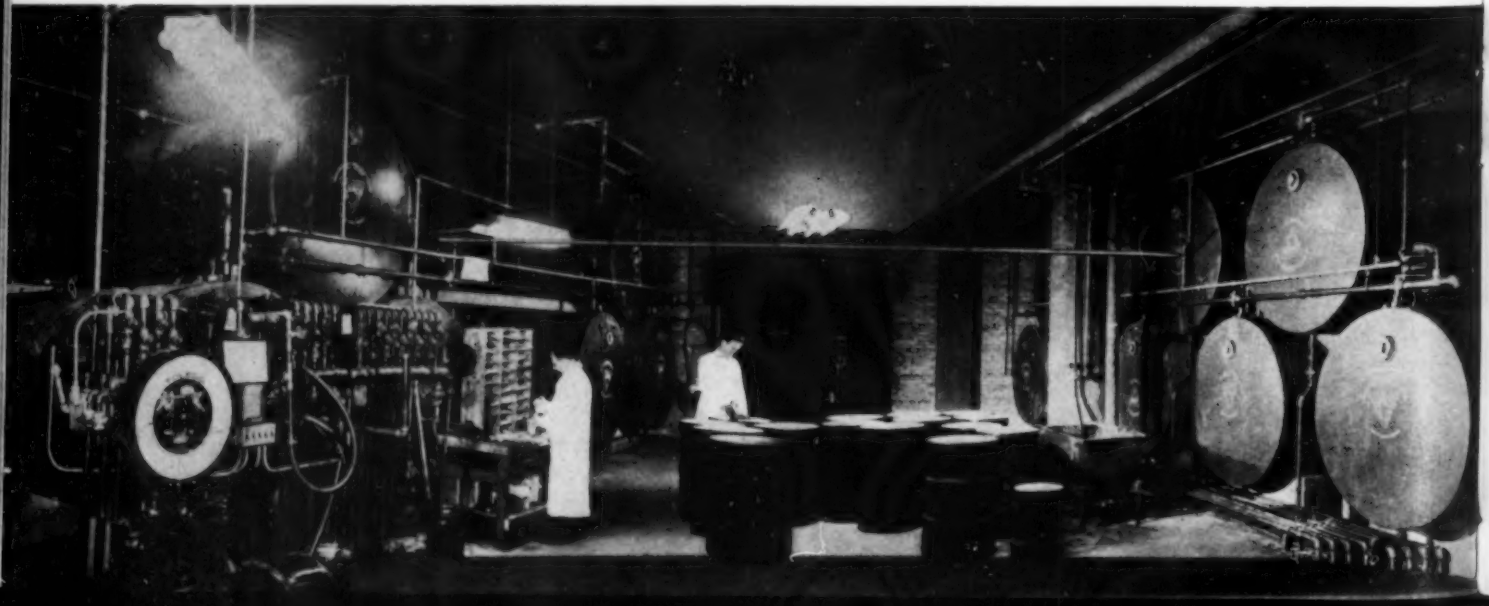
The original plant on Fulton Street consisted of a four room cottage with rickety front porch. The manufacturing area measured 300 square feet, but in spite of its size under the forcefulness and initiative of its founder, the business prospered and expanded until at his death in 1932, it occupied 40,000 square feet at 435 So. Western Avenue plus additional warehouse space.

Under the leadership of George Simmonds, president from 1932-49 (now chairman), in cooperation with a veteran staff including John Clark now vice-president, T. E. Labedz now executive assistant and other key men, the business enjoyed its period of greatest growth and prosperity. This progress is continuing under the current president, resourceful, young W. S. Jessop.

When the Western Avenue property was recently condemned and purchased from the corporation by the city of Chicago for the Congress Street Highway, it was necessary for the firm to seek new quarters elsewhere. This year U. S. Sanitary Specialties opened its new 92,000 square foot building on a site on California Avenue and Taylor Street, which was purchased two years ago. A modern, streamlined sanitary chemical, soap and soap dispenser manufacturing plant, a sanitary maintenance division and well arranged offices now occupy this building. It has truck level enclosed loading docks for 18 trucks, a four car switch with facilities for handling two cars inside the building, and elevators direct to car and truck levels.

U. S. Sanitary Specialties Corp. holds a leading position in its field. It sells to the ultimate consumer its branded line of soaps, dispensing equipment, floor maintenance products and sanitary chemicals. To jobbers and distributors the firm sells its line of "Soaperior" soap dispensers, as well as private brand products. Operations are directed from its main offices in Chicago and through divisional offices in New York and Dallas. In many metro-

Unique feature of the new plant is system of filling drums and five-gallon containers just before shipping. Liquid filling is done rapidly by novel devices shown at extreme left. On right are three rows of 1500 gallon storage tanks in two tiers. Filling is by weight, not volume.

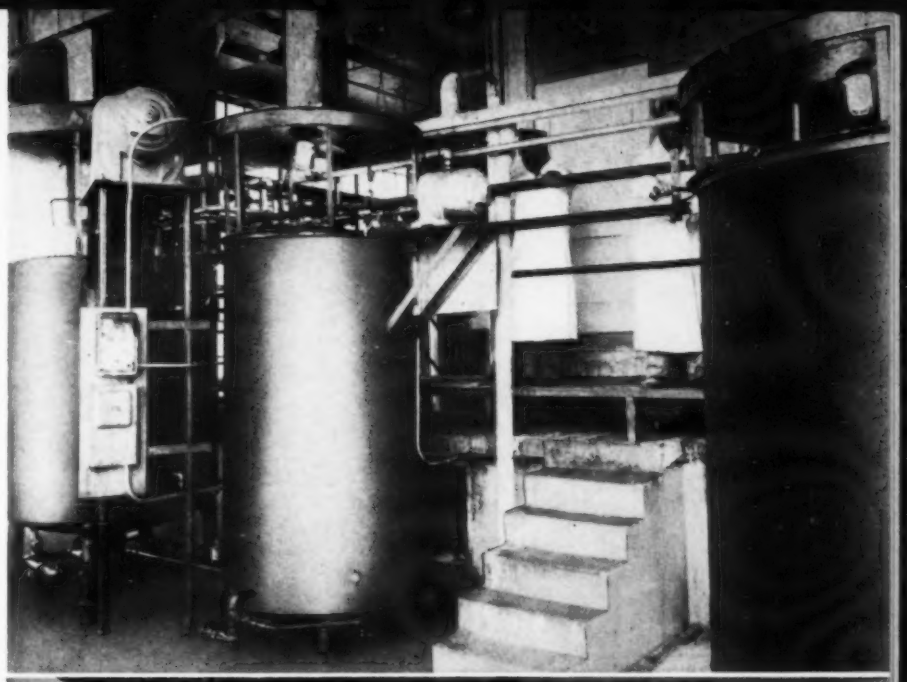


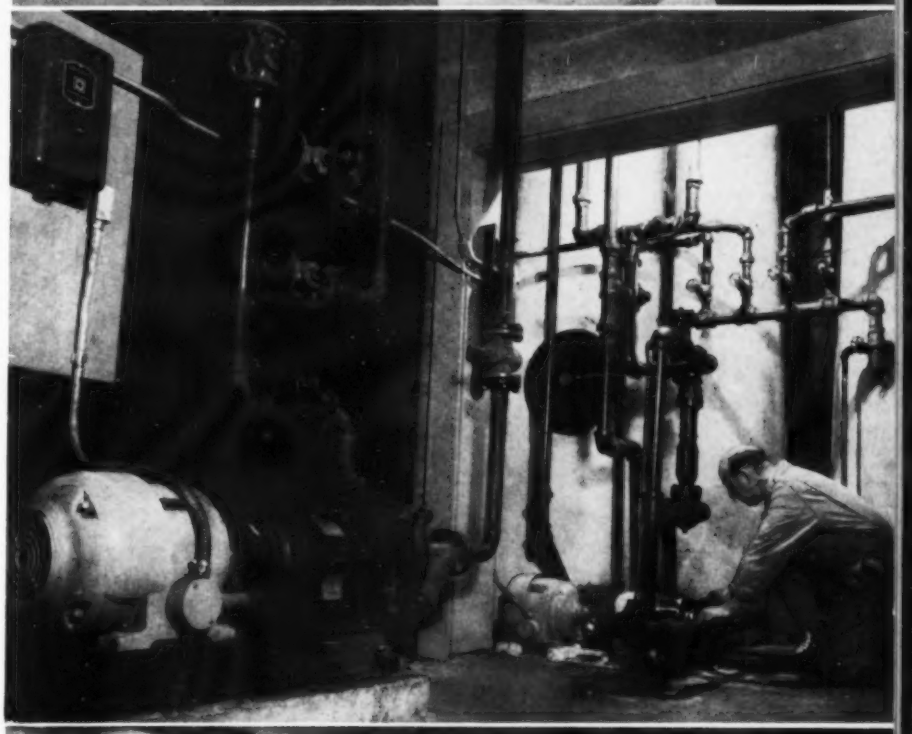
politan areas, the sales territories are further split into districts under sales supervisors. Soap dispensing equipment is largely sold through jobbers and distributors, through advertising, by exploiting its long established trade mark "Soaperior" and through recommendations of architects here and abroad. Foreign as well as domestic sales are of considerable volume. The corporation has associated companies in Mexico, England and Australia and their equipment is found throughout the world.

The company is most proud of

Corp. Plant

the length of time many of its key men and women have spent in its employ. James Madison, first salesman employed by the founder, chairman Simmonds and vice-president Clark are 25 to 30-year men. R. W. Ballentine, chief chemist in charge of soap and chemical manufacture and Otto Souhrada, shop foreman, have served from 20 to 25 years, with several of their assistants likewise holding impressive service records. Chief engineer and superintendent, Walter Hammond, who supervised installation of the new plant is a sixteen year man. Also in the 15 to 25 group are T. E. Labedz, executive assistant, B. J. Schoenberg, manager eastern division, Ed Faber, city sales manager at the New York office and Arthur Hays, manager of metropolitan sales at Chicago. These are but a few. Over half the sales force has had a ten year tenure and many plant employees





Shown on this Page

Upper right: soap kettles are operated from a raised platform. This facilitates easier control of boiling operation. Kettles are charged by gravity from oil storage tanks on the floor above.

Center: From storage tanks on the fifth floor oils are pumped to scale tanks on the sixth floor. Tanks and all piping for fatty acids are specially lined with a thermoplastic material to prevent discoloration.

Bottom: Scene in one of the company's research and testing laboratories.

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Sample and literature on request

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The shop for assembly and repair of soap dispensers is located in the four story wing of the new plant. It is arranged for easy and rapid flow of parts. A stock room directly adjoins the assembly room.

have service records of 20 years. It is a fine compliment to Messrs. Simmonds, Jessop and Clark that such an excellent esprit de corps exists. Mr. Jessop's aim is to continue the steady friendly growth, which promotes a feeling of security and pride in the organization and makes happy, satisfactory employment possible.

Moving Problems Overcome

THE job of moving the plant was planned to prevent interruption of production. In most cases, customers secured shipments promptly. The carefully worked out program actually resulted in an excess rather than shortage of finished products. Installation of the new plant was planned through frequent meetings of the company's executives, production force, building contractors and chemical consultant. Every detail was investigated exhaustively and, as a result, very few "bugs" were encountered in starting operations. It was quickly realized that operational streamlining and the installation of the newest types of machines and methods were going to pay off much sooner than had been expected.

In laying out the plant, some unusual and interesting conditions were encountered. The building is in two sections of four and six stories. It was built for a wholesale grocer and included a bakery, coffee roasting plant and refrigerated storage. The bakery section in the higher building was readily adaptable for making potash soaps, disinfectants, insecticides, dry powdered products, floor treating preparations, deodorant blocks, polishes, etc. To change over a large bakery, however, with its fermentation, mixing and cooling rooms, high ceilinged oven floors, raised spaces and other special building adjustments did offer more than one challenge. Now that the chemical plant is installed, most of the former construction turned out to be of decided advantage. No major alterations were found necessary, which resulted in important savings in money and time. Accompanying illustrations tell the story more vividly than words. Some brief remarks are needed, however.

The boilers used in operating the bakery were of larger capacity than was required for year-round processing in a chemical specialties plant. Besides they were located too far from the scene of operation. To overcome this, a Cleaver Brookes "Package" Boiler was installed on the fourth floor. It is completely automatic, including all safety devices, burns gas or oil and operates easily at between five and 125 pounds pressure through Minneapolis Honeywell "Pressuretrol" Valves. The change-over from gas to oil takes but a few minutes.

The old coal burning boilers are installed in a sub-basement with coal storage bins arranged so that cars on the tracks above empty directly into them. The coal storage space is now fitted with receiving tanks so that tank cars can unload liquid caustic potash and vegetable oils directly into them. Caustic is pumped to the sixth floor for dilution as required or to tank wagons for resale. Vegetable oils may be pumped to a series of storage tanks, directly to scale tanks for charging soap kettles or to tank wagons. Remote control switches regulate liquid levels at receiving points. All lines are protected against freezing and are easily drained.

Specially built, lined oil storage tanks are housed in a low ceilinged room. Each tank is equipped with outer coils for individual heating as required. The oil for each day's run is heated as needed. This reflects itself in better colored, higher quality soaps.

Tanks and all piping for fatty acids are specially lined with a thermoplastic material to prevent discoloration. From these storage tanks on the fifth floor, oils are pumped to scale tanks installed on raised platforms on the sixth floor and from which soap kettles are charged by gravity. Kettles drain into cooling tanks on floors be-

(*Turn to Page* 139)

Wax Wear Resistance...

Testing wear resistance of floor wax by means of radioisotopic techniques

By Bernice Cummings*
United States Testing Co.

SINCE the end of the war the Atomic Energy Commission has stressed the importance of applying radioactive isotopes to the solving of many industrial and medical problems. To further this program, the Commission has continuously declassified much of its collected data and made them available to the public. Furthermore, the cost of these radioactive elements has been reduced wherever possible. Industrialists were slow at first in utilizing this technique in their research investigation, due to the newness of the field and the lack of experienced personnel. For some time, over 80 per cent of the isotopes purchased were used in the medical and biological fields. However, in recent months our trade magazines have contained an ever increasing number of reports of new industrial applications of these radioisotopic techniques.

I will describe our work with radiocobalt 60 in evaluating the efficiency of popular brands of floor waxes of the self-polishing or water emulsion variety.

This investigation was made possible by the progressive attitude shown by the United States Testing Co. in the setting up of a radio chemical laboratory, and was done under the direction and supervision of Joseph J. Pescatore, formerly chief radio chemist of the U. S. Testing Company.

Testing with Isotopes

THE lack of satisfaction on the part of many with the conventional methods of testing the wear resistance of floor waxes lead us to devise a new method involving the use of radioisotopic techniques. The chief difficulty lay in the abrasion of the waxed surface. For, while in the beginning we actually obtained wear, upon continued abrasion what was effected was merely a polishing action with little wear recorded. Up to the point where the polishing action commenced, the amount of wear encountered was too small to be detected or measured by optical or mechanical

* Paper presented before the mid-year meeting Chemical Specialties Manufacturers' Association, Hotel Drake, Chicago, June 13, 1950.

instruments. The use of radioisotopes, however, provides us with a test so sensitive that the wear occurring in the early phase of abrasion can be measured.

Before describing the test itself, let me first review briefly the properties of radioactive materials which make them so useful in the laboratory. A radioisotope might be thought of as a twin element. It acts chemically exactly like its counterpart and is very similar in its physical properties, differing, however, in mass and in the fact that it emits a characteristic radiation. This radiation can be tested by several instruments. For our purposes we use the Geiger-Mueller tube which attached to a scaling unit will record the amount of radiation per unit ton.

These radioactive emissions are emanated in all directions much as the rays of the sun. So, if we were to measure the activity at a distance of one inch and then move the window of the GM tube 2 inches away and take another measurement, the percentage of rays detected in the first position would be far greater than those in the second (following the inverse square law). Thus, we can see the importance of maintaining a constant geometry, that is, a fixed spatial relationship between the sample and the tube.

Several factors must be considered in the choice of a radio element, such as the type and strength of rays emitted by the substance and the half-life of the isotope. If the radiation is too weak, some of it may be absorbed by the layer of wax, by the air medium between the surface of the sample and the window of the tube and even by the density of the tube window itself, thus diminishing its efficiency. The half-life of an isotope is the amount of time required to effect the decay of a radioactive element to one-half of its original strength. For instance: if we have 10 curies* of an element whose half-life is one week, at the end of the first week there will remain five curies; at the end of the second week, two and one-half, and so on.

In the case of the water emulsion waxes, we synthesized cobalt sulfate, a water soluble salt. Cobalt 60 emits highly penetrating gamma rays, and has a sufficiently long half-life (5.3 years) to render the decay factor negligible, since the test is completed in a relatively shorter time.

The A.E.C. supplied us with the radiocobalt in the form of cobalt oxide. This black powder was subsequently dissolved in concentrated sulfuric acid to give us the desired cobalt sulfate. A few drops of this solution were added to a measured volume of the liquid wax and completely dispersed throughout the solution. The next step was to determine whether the cobalt ions were equally distributed throughout this mixture. This was accomplished by taking random aliquots of the now-tagged wax (that is, the radioactively labelled wax) and, by means of the Geiger-Mueller counter, ascertaining the homogeneity by correlation of the count per unit ton per weight. Incidentally, a count is the unit measurement of one radioactive particle being picked up by a GM tube. If we say that a certain specimen emanates at the rate of 1000 counts per minute, we mean that our tube has picked up 1000 radioactive particles during the course of one minute. Radiation is a random phenomenon and for this reason in working with radioisotopes a large part is played by the statistician, and a representative count must be taken to insure correct results.

Wax Made Radioactive

ONCE the wax has been made radioactive, a known volume is applied to a specified area on a clean, dry linoleum and allowed to dry. An initial reading was made of the activity of a surface area one inch in diameter, and the same geometry maintained as was used in determining the specific activity. Thus, with the aid of the specific activity factor, the weight of wax per unit area was computed.

The surface was then subjected to a wear process designed to simulate actual conditions. A 150 pound roller, around which were fastened the soles of a man's shoes, was rotated back and forth over the surface. After a fixed number of abrasions, the surface was again measured in the same spot as before, and the loss in weight of the wax per unit area was determined.

This process was repeated a certain number of times, and a graph showing the weight of the wax charted against the number of abrasions was constructed, thus giving a visual picture of the resistance of the waxes to wear, and enabling us to compare the wearing quality of several waxes of the same type.

This is but one of the many possible applications of radioisotopes to industrial problems. At United States Testing Co. we have employed successfully radioactive cobalt, carbon, calcium, iron, phosphorous, etc., in furthering the advances of new test methods, and in solving problems in which normal conventional test procedures failed. In the future we believe that radioisotopic techniques will replace many of the present day methods, giving us a much greater degree of accuracy and sensitivity. No modern laboratory will be complete without a radio chemical section.

*A curie is the amount of radiation emanating at the rate of 3.7×10^{10} counts per second.

Moth-Controlling Product

A product designed as a moth preventive contains 94 per cent hexachloroethane, five per cent sodium bicarbonate, and one per cent chloretone. Ital. Patent 441,561, through *Chem. Abstracts.*

Effectiveness of WARF 42

A bait mixture of W.A.R.F. 42 and finely ground corn, at a poison concentration of 1mg./gram, was found to reduce the rodent population by 84.5 per cent in a recent test covering six slum blocks in Baltimore, Md. A total of 13 blocks were used in the test, six for poisoning, and seven for control. The greatest mortality was found to occur between the fifth and sixth day after poisoning, following which a gradual decline with many fluctuations set in. M. W. Schein *Public Health Reports* 65: 368 (1950).

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NBIN Emulsion vs. EEAY Solution as

BODY LICE OVICIDE

By Roger W. Williams†
School of Public Health
Faculty of Medicine
Columbia University

VARIOUS investigators (1, 2, 3) have reported on the effectiveness of an emulsion having the code letters NBIN, containing 10 per cent benzyl benzoate two per cent benzocaine, one per cent DDT, two percent "Tween 80," and sufficient water to make 100 ml., for the treatment of lice and scabies. One of the variations of this formula was a solution designated as EEAY (1) which differed from the emulsion by the absence of "Tween 80" and the substitution of 95 per cent ethyl alcohol for the water. Both the emulsion (NBIN) and the alcoholic solution (EEAY) were reported to be extremely active against adult lice and their eggs, killing 100 per cent.

A solution,* differing from the EEAY formula only in that 22 per cent medicinal soft soap and 0.2 per cent lavender oil had been added and an emulsion,* which contained in addition to the standard ingredients in the NBIN preparation 0.2 per cent lavender oil and 0.4 per cent more "Tween 80" (2.4 per cent), were tested by the dipping method as toxicants to eggs and adults of the body louse, *Pediculus humanus corporis*, to determine which of the two formulas was superior as an ovicide and which caused the quickest kill of adults. The following ingredients from this solution and emulsion were also tested individually as ovicides.

10% benzyl benzoate in 100% ethyl alcohol (U.S.P.)
10% benzyl benzoate in 2.4% tween-water
1% DDT in 100% ethyl alcohol
22% soft soap in 100% ethyl alcohol
2% benzocaine in 100% ethyl alcohol
100% ethyl alcohol

The author is indebted to Dr. Ralph E. Heal, formerly of Merck and Co., Inc., Rahway, N. J., and now technical director, Natl. Pest Control Assn., for the eggs and lice with which to carry on this experiment.

Materials and Methods

THE solution and emulsion tested are intended for use against head lice. The body louse was used in this test because reared specimens were available and eggs of known ages could be obtained. The difference in resistance between the body louse and the head louse has been found to be negligible for the insecticides tested against them (4). Louse eggs were used from a strain of human lice, successive generations of which had fed on rabbits as their only source of food for more than two years. The eggs, deposited on human hair, were of known age when tested, falling into four age groups; less than one day, two to three days, five to six days, and eight to nine days.

Hairs bearing eggs from each age group were immersed in the stock solution and emulsion in shell vials for five and 10 minutes and in each of the separate ingredients tested for five minutes. Emulsions were agitated throughout the test to give an even distribution of the test material. Upon removal from the liquids the hairs were placed on paper toweling and the eggs and hairs permitted to dry in the air. They were then placed in clean shell vials, the bottoms of which had been replaced by a fine mesh cotton cloth, and stoppered. The vials were deposited in a large sealed relaxing chamber which was stored in an incubator set so that the temperature within the relaxing chamber was 30°C.

A saturated solution of ammonium chloride, which filled the lower portion of the relaxing jar, maintained a gauged humidity within the jar of from 70 to 75 per cent. The proportion of eggs which will hatch is affected by the temperature, the range 29 to 32°C. being most favorable, and humidity does not affect the incubation period but high or low humidity tends to increase the mortality (5). All eggs were examined when they attained an age of 13 to 14 days. Since eggs began to hatch between the seventh and eighth day the number of eggs used in the eight-nine day age group tests was considerably smaller than for the other age groups.

The number of hatched and dead eggs were recorded (Table I) and the percentage of eggs killed by each substance tested was determined by Abbott's formula (6) (Table II). An egg was considered to be hatched only if the young louse had completely emerged from its shell. In some instances lice died before they had completely emerged (particularly in benzyl benzoate) and these were considered as unhatched eggs. Abbott's formula for determining the effectiveness of an insecticide, which takes into consideration those eggs which die from natural causes, is

$$\frac{X-Y}{X} \times 100 = \text{per cent}$$

control; X = per cent living in control, Y = per cent living in treated sample, X-Y = per cent killed by treatment.

Adult lice of unknown ages clinging to gauze were immersed for five to eight minutes and 10 to 12 minutes in the stock solution and emulsion. Upon removal they were placed on clean gauze and observed periodically until all had died (Table III). They were maintained at room

† With technical assistance by Miss Maude Nicholls.

* Supplied by the Therapeutic Research Foundation, Inc., Philadelphia.

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TABLE I

The effect of immersion in a modified NBIN emulsion, EEAY solution and their separate ingredients upon the eggs of Pediculus Humanus Corporis

Age of Eggs	*Control*		*5 Min. Solution*		*10 Min. Solution*		*5 Min. Emulsion*		*10 Min. Emulsion*		*10% B.B. tween-water*		*10% b.b. Alcohol*		*1% DDT Alcohol*		*2% benz. Alcohol*		*22% Soft Soap*		*100% Alcohol*	
	H	*D*	*H*	*D*	*H*	*D*	*H*	*D*	*H*	*D*	*H*	*D*	*H*	*D*	*H*	*D*	*H*	*D*	*H*	*D*	*H*	*D*
Less than 1 day	162	7	0	135	0	199	2	115	0	112	8	100	1	76	13	86	0	123	24	23	74	8
2 to 3 days	118	6	0	116	0	105	0	121	0	151	4	69	0	144	4	110	1	69	22	26	48	7
5 to 6 days	128	14	0	117	0	104	1	116	0	194	23	73	24	49	9	86	0	201	51	56	120	8
8 to 9 days	17	3	1	16	0	19	12	8	10	6	6	16	5	12	1	13	13	8	5	11	18	4

TABLE II

Per cent kill of eggs based on Abbott's formula.

	Per cent Living in Control										
Less than 1 day	95.9	100	100	98.2	100	92.8	98.6	86.2	100	46.7	5.9
2 to 3 days	95.2	100	100	100	100	94.2	100	96.3	98.6	51.9	8.3
5 to 6 days	90.1	100	100	99.0	100	72.3	65.0	89.5	100	47.1	0.0
8 to 9 days	85.0	93.1	100	29.4	26.5	67.9	65.3	91.6	27.2	63.2	3.8

H—Hatched
D—Dead
b.b.—Benzyl benzoate
benz—Benzocaine

temperature and humidity throughout the observations.

Results and Discussion

FROM Table II it is evident that the benzyl benzoate, benzocaine, DDT solution killed 100 per cent of eggs of all ages when they were submerged for 10 minutes and killed nearly 100 per cent when immersed for only five minutes. The emulsion, on the other hand, although nearly as effective as the solution in killing eggs six days of age or less, failed to give a satisfactory kill of eight to nine day old eggs even when immersed for 10 minutes.

Eddy (1) has pointed out the ovicidal effectiveness of an emulsion of the type used is due mostly to benzocaine. Benzocaine (two per cent) in ethyl alcohol also failed to kill eight to nine day old eggs, the per cent killed being essentially the same as with the stock emulsion used for five and 10 minutes (27 per cent). This confirms Eddy's observations that in an emulsion it is the benzocaine that is the chief toxicant to the eggs but it also indicates that benzocaine has little effect on louse eggs which are within a few hours of hatching, i.e., benzocaine requires several hours to kill the eggs and hatching will occur if treatment is given after a certain critical time.

The solution retained its effec-

TABLE III

Results of immersing Pediculus Humanus Corporis adults in a modified NBIN emulsion and EEAY solution.

Time	*Control*		*5-8 Min. Sol.*		*10-12 Min. Sol.*		*5-8 Min. Emul.*		*10-12 Min. Emul.*	
	A	*D*	*A*	*D*	*A*	*D*	*A*	*D*	*A*	*D*
3¼ hrs.	20	0	19	0	4	16	19	0	20	0
5½ hrs.	20	0	5	14	3	17	19	0	20	0
6 hrs.	20	0	4	15	0	20				
7 hrs.	20	0	4	15						
8 hrs.	20	0	2	17						
10 hrs.	20	0	2	17						
12 hrs.	20	0	0	19						
22 hrs.	20	0					1	18	4	16
24 hrs.	20	0					1	18	4	16
25 hrs.	20	0					1	18	3	17
26 hrs.	20	0					0	19	1	19
29 hrs.	20	0							1	19
30 hrs.	20	0							0	20

A—Alive
D—Dead

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tiveness on eight to nine day old eggs, particularly on those which were immersed for 10 minutes. Since benzocaine in alcohol does not kill a high percentage of eight to nine day old eggs it would seem that benzocaine in the solution tested plays a relatively small part in determining the toxicity of the solution *per se* to the older eggs, unless the other ingredients have a synergistic action on the benzocaine.

DDT (one per cent) in alcohol gave a relatively high degree of kill to eggs of all ages when they were immersed for five minutes. Possibly in the emulsion the toxicity of the ingredients is so altered that only benzocaine remains active and this ingredient fails on the older eggs, whereas with the solution when benzocaine fails, DDT or a combination of DDT and the other ingredients maintain their toxicity or can penetrate the egg shell quicker because they are in a solution and thus a relatively high mortality rate in the eight to nine day old age group resulted.

Eddy (4) found that humidity influences the ovicidal value of certain compounds, particularly humidities below 70 per cent which tended to decrease the toxicity. Although the humidity at which the eggs in this experiment were incubated was always 70 per cent or higher it is possible that a different humidity would increase the toxicity of benzocaine to the eight to nine day old eggs.

Benzyl benzoate (10 per cent) in both alcohol and "Tween" (2.4 per cent)—water gave considerably better than a 92 per cent kill of eggs up to three days of age (Table II). Its efficiency seemed to decline somewhat on older eggs (65-72 per cent). The age of the eggs does not seem to be a factor in determining the per cent killed by DDT (one per cent) in alcohol. An overall mortality irrespective of the age of the eggs was about 90 per cent. Soft soap (22 per cent) killed approximately 50 per cent of all eggs regardless of age, when permitted to dry and remain on the eggs until they were examined. Absolute ethyl alcohol had very little effect on the survival of eggs.

All adults were killed by both the emulsion and the solution, however the solution was much more rapid in its action requiring less than six hours to give 100 per cent kill of those adults which were immersed from 10 to 12 minutes. About 12 hours elapsed before those adults which had been submerged from five to eight minutes were no longer able to respond to stimulation. Between 26 and 30 hours elapsed before the adults which had been immersed in the emulsion were all dead. There was a 100 per cent mortality first among those which had been immersed in the emulsion for the shorter time interval.

Summary

THE insecticidal activity of a modified NBIN emulsion and EEAY solution, both of which are intended for use against the head louse, and their individual ingredients was tested on eggs of the human body louse which were accessible and of a known age. The eggs, which had been deposited on human hair, were dipped in the solutions and emulsion and allowed to dry. It was found that the solution was superior to the emulsion as an ovicide since it killed 100 per cent of the eggs of all ages which had been immersed for 10 minutes and gave excellent control at the five minute level. The emulsion failed to kill many of the eggs which were within a few hours of hatching. Benzocaine, which was the most effective ovicidal ingredient of the emulsion, likewise was ineffective against eggs of this age group indicating that the toxicity of the emulsion is due largely to benzocaine. The solution was active on these older eggs apparently because DDT, or DDT in combination with the other ingredients, could act for benzocaine when it failed or else the other ingredients in the solution had a synergistic action on the benzocaine.

The solution killed adult lice in about one-fifth of the time (six hours) required of the emulsion following a 10 to 12 minute exposure period and less than half the time (12 hours) when they were immersed from five to eight minutes.

Of the two formulas tested the modified EEAY solution appears to be more desirable than the modified NBIN emulsion from the standpoint of toxicity to louse eggs and time required to give 100 per cent control of adult lice.

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Aerosol Insecticides

A formulation containing 20 per cent 2-ethyl hexanediol-1,3, 79 per cent dichlorodifluoromethane as propellant, and 10 per cent isopropyl alcohol as solvent, is designed for use on exposed skin and clothing as a protection against mosquitoes, gnats, flies, chiggers and other insects. The product is sprayed on, and should not be directed toward the eyes or mouth.

An aerosol for use on dogs, killing gnats, ticks, fleas and flies, contains: .20 per cent pyrethrins, .10 per cent hydrogenated rotenone and other cube resins; .90 per cent technical piperonyl butoxide, 1.0 per cent citrus oils; 1.85 per cent ethylene glycol ether of pinene; and 5.85 per cent petroleum distillate. The balance is a propellent composed of a 50:50 mixture of Freon 11 and Freon 12. *Chemical Industries* 66, No. 6, 828.

DDT Fly Resistance

DDT and methoxychlor deposits in wettable powders and acetone were tested on four strains of houseflies. Mortality after 15 minutes, 240 minutes and 24 hours was checked after 15 minute exposures to the insecticides. The mg/sq. ft. of DDT from wettable powder required for 100 per cent kill was as follows: 2.5, 2.5, 2.5 and 38 for the four strains of flies. Methoxychlor required under the same conditions was: 4.7, 7.2, 7.4 and 6.2, respectively. Results from acetone confirmed those obtained with the wettable powder. *J. Econ. Entomol.* 42, 843-4 (1949).

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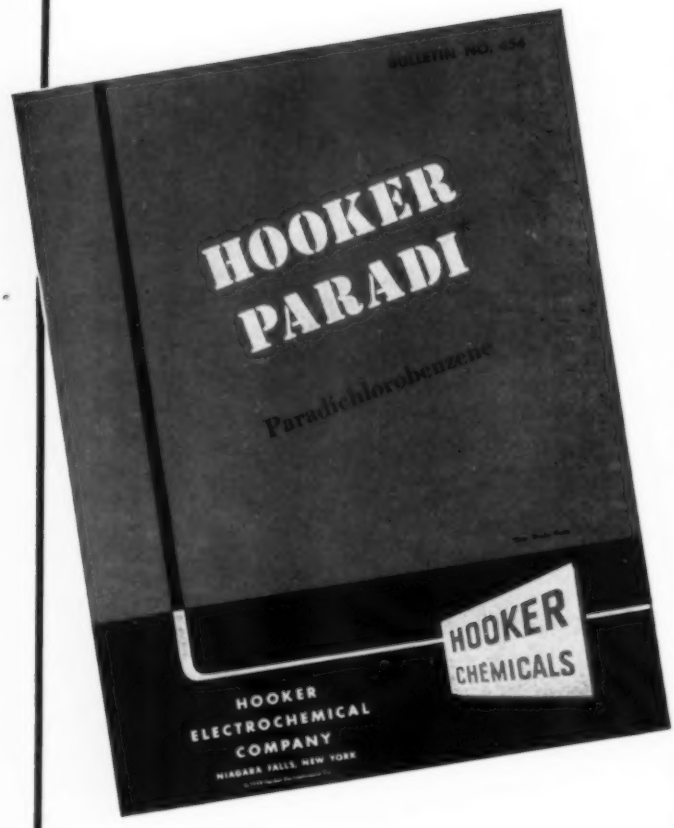

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TOXICITY

Toxicity is defined, the importance of determining its degree in a substance to be used in a chemical specialty and basic toxicity tests are discussed.

By Dr. Herman A. Shelanski*
Industrial Toxicology Laboratories

IN speaking of the toxicity of a substance we are merely stating what the deleterious effect of a substance is on the normal physiologic response of a given biological system. A biological system may be defined briefly as any living organism of plant or animal origin. Thus, the effect of a substance on the physiologic response of a biologic system called bacteria may vary from the effect of the same substance on the physiologic response of a biologic system called man.

These effects may vary in different biological systems or, in other words, the effects on different organisms may vary. Therefore, it becomes important, once it is established that a substance will harm insects, to determine whether this same substance will harm man. Thus it is necessary to determine the toxicity of a substance. Toxicity may be defined as the sum total of all harmful effects upon an organism. In this paper we will confine our remarks to the toxicity of materials to warm-blooded animals, including man.

From a practical point of view it is important to determine before toxicity studies are conducted if the substance in question has a use. This use may also vary so that the material to be studied may have good germicidal properties, or it may be a good vehicle for carrying a substance which has such properties, or its use may be to enhance the properties of a substance, from the manufacturing point, marketing, or aesthetic viewpoint. If the substance has no determined usefulness, then further studies on it are not indicated.

The second factor to be considered is: Can this substance be made in a standard manner? Will it be a uniform product? Will it be the same five years from now? In other words, unless the product is standardized and has usefulness, it is not necessary to determine its toxicity, since the toxicity studies are valid only if the product is representative of that which is to be sold to the consumer. Changes in formulation of a material, so that it differs chemically or physically from a product whose toxicity is known, invalidates this information. Once a standardized product is developed and is shown to be useful the question of toxicity becomes important.

We are concerned with the toxicity of materials which, during their use, may come in contact with food or other materials that in turn may be ingested orally, directly or indirectly. It is, desirable therefore, to determine what the effect of a single large dose of the test material has on the individual. The effect on man, incidentally, is inferred from the toxicity on other mammals. It is obviously desirable, however, to determine the effect of a single large dose of the test material, so that if someone should accidently swallow a quantity of the material, the effect on the individual might be determined. Acute toxicity studies by vapor, aerosol or spray exposure are necessary in those cases where a substance is used as a fluid dispersed in air, and as such may come in contact with humans through inhalation. It may also be necessary to do acute toxicity studies by skin absorption if a substance used comes in contact with large areas of body surface.

In each case the acute toxicity test tells what the effect of a single large oral dose, or a single large vapor, aerosol or spray exposure, or of a single application to a large area of the skin, will be on an organism. The words "single exposure" supplement the acute toxicity test. In the acute toxicity test we are interested in three values. Namely the L.D. 100 or that dose or exposure which will kill all animals studied; the L.D. 50 or that dose or exposure which will kill half of the animals studied and the L.D. O or that dose or exposure which will kill none of the animals studied. Not less than two species of animals should be used in this study and three species of animals are recommended. One species should not be a rodent. As mentioned before a given substance will affect several species of organisms differently, therefore, more than one species of animal should be studied for comparative purposes.

For example, the thio-cyanoacetates have been shown to be useful as insecticides on dogs, cattle, sheep, humans, etc. They are also quite harmless in fairly large doses even on repeated use for considerable periods of time in these animals. On the other hand, the use of these compounds in cats will produce fatal results even with a single small dose.

Another example is found in studying blood plasma or blood plasma substitutes. These experiments can well be tolerated by cats, rabbits, and other animals. The dog in this case, however, cannot be used since he is sensitive to his own individual serum. Therefore, if a sample of blood is removed from a dog and the plasma separated and subsequently transfused into the same dog, the results are often fatal and nearly always produce severe shock and pharmacologic disturbance. These illustrations indicate the necessity for studying the toxicity of a substance on several species of animals.

When we have determined the acute toxicity values for a substance we are now able to study the material further. Just because a substance may be non-toxic from the acute toxicity standpoint does not mean that the material is safe for use; and conversely because a substance appears to be toxic in larger doses does not mean it is unsafe for use. I should like to cite two substances as examples. A man may safely ingest in one dose over a pound of mercury. The mercury would simply pass through the alimentary canal and be egested. There would be no toxic or harmful effects from the mercury. On the other hand if we took this pound of mercury and divided it into 365 small doses and took one dose each day, he probably would not get as far as 50 days without fatal effect. Conversely, however, if an individual ate a pound of common ordinary table salt or sodium chloride in one dose the results would prove fatal, but on the other hand, if the pound of table salt were divided into 365 small doses and a small dose taken each day an individual could go through his entire life without any toxic effect from the salt.

These illustrations impress upon us the need for the chronic toxicity study. In these studies we are interested in the "repeated exposure" in contrast to the "single exposure."

Study Three Dosage Levels

THE material studied is usually given at several dosage levels, usually three. These dosage levels are usually based on the results obtained in the acute toxicity tests and on the maximum probable exposure which would be encountered in the actual use or manufacture of the substance. When the maximum probable exposure is calculated, the lowest dosage group in the chronic test should be ten to one hundred times higher than the estimated probable use. Thus, if a substance is to be used in foods or in contact with foods or in any way might contaminate foods then that lowest dosage level should be 100 times the estimated maximum probable exposure. For substances not in the food or food contact class the lowest exposure can be considerably less than 100 times the maximum probable exposure, again depending on the end use of the material. The lowest dosage level is one which should not produce toxic effects

* Before 36th Annual Meeting, C.S.M.A., Washington, D. C., Dec. 5, 1949.

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during the study if the material is to be considered safe for use.

The second dosage level is usually selected at 5 to 10 times the lowest dosage level and probably will be the point at which some damage will appear in the animal during the study.

The third dosage level is usually selected at 10 times or over the lowest dosage level and probably will be the point at which not only is some damage done to the animals, but which will result in fatalities to some of the animals in this group.

The time required for these studies again depends upon the use to which the material is to be put. If a substance is considered as one of the food classification, it is necessary to conduct these experiments for the lifetime, or for at least two years, of one species of animal, usually the white rat; for one year on a second species of animal, usually the guinea pig; and for six months on a third species of animal, not a rodent, usually dogs, cats, or monkeys. This study will answer not only the question of toxicity, but particularly in the lifetime study of the rat it will determine whether the substance tested is carcinogenic, that is its ability to produce cancer.

In many cases, however, particularly those in which the substance will not come in contact with foods, the period of time necessary may vary from a thirty to ninety day sub-acute study to a six month chronic study. The length of time involved depends on the nature of the substance and the use to which it will be assigned. Once again it is recommended that the tests be conducted on at least two species and preferably on three species of animals. The route of administration of the material will again depend on the use for which the material is to be recommended. Thus, the material may be fed directly into the stomach of the animal, it may be placed in the feed, the animal may be exposed to inhalation of vapors or aerosols or sprays of the materials or the skin of the animal may be exposed to absorption of the materials.

It must be borne in mind that the route of administration is dependent on the end use of the material to be studied.

Effect on Skin

IN addition to the above tests it is very important to determine the effect of a substance upon the skin of an animal. Primary irritation is one skin effect. It is the effect produced on the skin by a substance which is placed in contact with it. The degree of primary irritation is dependent upon several factors. The concentration of the material employed is a very important factor. Some substances will produce four plus irritation in the matter of minutes when used in concentrated form, whereas others will not. However, as the material is diluted with a suitable vehicle the irritation may not appear until the material is kept in contact with the skin for several days. Eventually the dilution of the material will be determined at which there is no irritation even when the material remains in contact with the skin for many days. Therefore, the fact that a material is a primary irritant is not too important since by controlling the concentration and length of time of application to the skin the irritant properties may be avoided. It is necessary to determine further effects on the skin. There are many substances which can be kept in contact with the skin at high concentrations for long periods of time without producing any visible signs of irritation. Then, suddenly and usually without warning, a very slight exposure to or contact with the substance will produce a local or even generalized reaction on the skin. The reaction may vary with the substance used from a slight irritation or eczematic condition to a severe vesicular effect with weeping vesicles and desquamation. It is this substance which produces no initial irritant effect but a delayed allergenic reaction that is known as a sensitizing substance. Sometimes a substance will have primary irritant and sensitizing properties. In these cases, if a dilution of the substance having a primary irritant effect is applied, on reapplication even 1 per cent will produce as severe a reaction as the concentrated substance did on first application. The sensitizing substance is the dangerous substance where the skin is concerned, because one is unaware of its potential sensitizing powers.

Primary irritation studies may be conducted on rabbits and guinea pigs by applying the material to the closely clipped skin of these animals. Sensitization studies should be conducted on guinea pigs by intra-cutaneous injection. When the animal work is completed patch tests should be performed on human subjects to determine primary irritation and sensitization. At least two hundred unselected subjects, 100 males and 100 females, should be studied, and at least one competent dermatologist should read the reactions. It is important that the study be carried out on unselected subjects and not patients in a skin clinic, who are there because of some existing pathology of the skin. It has also been our experience that it is difficult to predict the effect of a compound on the skin of an individual on the basis of the skin complexion, color of hair and condition of skin (oily or dry). For this reason again not less than 200 subjects should be studied and these subjects should be unselected. Details of the various types of toxicity studies have been adequately covered in a paper entitled "Procedures for the Appraisal of the Toxicity by Chemicals in Foods" by Drs. Arnold J. Lehman, Edwin P. Laug, Goeffrey Woodard, John H. Draize, O. Garth Fitzhugh, and Arthur A. Nelson in the September, 1949 issue of Food Drug & Cosmetic Law Quarterly. Photostats of this paper are available from Dr. A. J. Lehman, Chief, Division of Pharmacology, Food & Drug Administration.

The toxic hazards of a formulation can not always be predicted on the basis of the toxicological properties of the germicide used in the mixture. If a simple change in formulation is made, such as using less germicide or increasing the amount of the vehicle by adding more water or oil to the formula or substituting a vehicle or base which has been proven to be inert in the presence of the germicide, then some predictions can be made on the known toxicological information of the germicide. However, changes in formulation which alter the germicide chemically or physically are to be avoided since additional toxicologic information might be necessary. This is particularly true of materials coming in contact with the skin, since the change in formulation might increase the penetrating properties of the germicide and influence its skin absorption ability.

Changes in formulations which include those in pH, or addition of soap or alcohol or change from a mineral oil to a vegetable or animal oil base, influence the toxicological properties of a substance in a formulation.

Thus, many germicides may be found less toxic in an inert base than in a base which might be digestible or which might influence its penetrating or absorbing abilities.

Similarly, one cannot predict the toxic hazards of a compound by information obtained on related compounds. Thus methyl alcohol is toxic and ethyl alcohol is not, ethylene glycol is toxic and propylene glycol is not; peanut, soybean, corn, olive and cottonseed oil are not toxic but castor oil and chaulmoogra oil are. One may make certain assumptions concerning the toxicity of a member of a group of compounds of known toxicity, but he is unable to predict the toxicity of the compound.

An understanding of the toxicology and formulation is as basic as an understanding of the phenol coefficient of one's formulation or an understanding of the chemistry of one's formulation. In addition the toxicologic understanding of one's compound is a good form of insurance since accurate and adequate limitations can be placed on its use and handling in manufacturing the formulation.

The personnel handling the operations in the manufacture of a disinfectant are also further assured of safety in their employment when the toxic properties of a substance have been determined. A knowledge of the toxicity of the substances involved in manufacturing indicates the proper industrial hygiene conditions to be followed in this industry. Thus, if a substance is a known skin sensitizer, care must be exercised to prevent the worker handling this material from getting the substance on his skin. Likewise if the vapors of a material are toxic, proper precautions should be taken. The wearing of the proper respirator might be the answer.

A knowledge of the toxicity of a substance or formulation not only protects the manufacturer of that substance in guiding the consumer in its end use,

(*Turn to Page* 139)

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Development of a Rodenticide Cartridge

By Irvin Fuhr*, Sidney J. Magram and Seymour D. Silver

Army Chemical Center, Maryland

FUMIGATION is an important method of controlling rodent pests, including those which live in underground burrow systems. Thus, the woodchuck is best controlled with fumigants such as carbon disulfide, calcium cyanide dust, exhaust from gasoline motors, and the Fish and Wildlife rodenticide cartridge (3, 4). These materials are also effectively used against other burrowing animals such as ground squirrels, prairie dogs, rats, and pocket gophers.

The 100 gram Wildlife cartridge has a cylindrical body and an easily-ignited fuse and emits toxic combustion products when burned. Its chief ingredients are sodium nitrate, charcoal, sulfur, red phosphorus, and fuel oil. Although the demand for this device by farmers and ranchers has been quite heavy (more than 1,000,000 in 1945) the Wildlife group was not satisfied with its performance and asked the Medical Division laboratory at Army Chemical Center to attempt to improve it. It was essential that, in addition to generating sufficient quantities of toxic substances when burned, the finished product be inexpensive, sure-firing, easy to operate, stable when stored, and non-toxic until burned. The cartridge also must produce sufficient smoke to trace the ramifications and hidden exit holes of the burrow.

With these facts in mind, this laboratory developed a cartridge which generated cyanide gas. This unit was field-tested against prairie dogs in Colorado and was found to be considerably less toxic in burrows than in an Edgewood metal gassing chamber of approximately the same volume. These results indicated that soil sorbed a considerable portion of the cyanide vapor. This indication was confirmed in a series of experiments which showed that sulfur dioxide, phosgene, hydrogen cyanide, and hydrogen sulfide are rapidly sorbed by soil, whereas carbon monoxide, carbon disulfide and methyl bromide are little affected by soil (2).

Consequently, work on the cyanide-generating mixture was discontinued, and research was begun on devising a carbon monoxide-producing formulation since it was believed that the latter gas could be generated cheaply and conveniently by a cartridge. Analyses showed that, of the many formulations studied, one (Mixture A) yielded the largest volume of carbon monoxide when burned. As a result of these tests, a series of experiments on the toxicity of this mixture was run.

These toxicity experiments were conducted with white laboratory rats in a simulated 250-liter burrow system which consisted of three connecting runways dug underground. The longest continuous burrow was approximately 20 feet in length. Thus, this experimental burrow was approximately the same size as those dug by prairie dogs and woodchucks and was considerably shorter than the average rat, ground squirrel and pocket gopher system. The three exit holes of our burrow were sealed with glass windows allowing a clear view of the

Preparing for tests of the rodenticide cartridge. The Chemical Corps' cartridges may be seen standing on the cases while the Fish & Wildlife cartridges are in the pile at the left.

* Present address, Division of Research Grants and Felowships, National Institutes of Health, Public Health Service, Bethesda, Maryland.

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TABLE 1. Field Tests. Relative Toxicities to Prairie Dogs of Various Rodenticide Cartridges

Type of Cartridge	*Weight of Mixture*	*Mortality**	
		Fraction	*%*
	g.		
Fish and Wildlife	100	142/159	89
Chemical Corps (Mixture B)	130	285/289	99
Chemical Corps (Mixture B)	90	213/222	96

* In most tests all of the holes in a test area were covered with soil. The following day only those entrances opened from within (active burrows) were gassed. The gassed burrows were quickly sealed with soil and inspected the following 2 to 3 days. An opened hole after gassing represented a cartridge failure.

rats during the tests. Further details can be found elsewhere (1). In these typical studies to be reported, 50 grams of Mixture A were burned, and the rats were either caged 20 feet from the burning material or allowed to wander freely in the burrow.

It was found that the carbon monoxide which had been generated persisted in lethal quantities for at least 24 hours. Rats inserted into the burrow a day after the mixture was burned were killed in three hours. The majority of the animals in these and other tests in which the rats were not caged did not remain in the purest air, but, as the gas began to exert its effects, went into higher concentrations of gas and irritating smoke.

Diffusion is Important

IN THE non-persistent experiments in which the rats were in the runways when the cartridge was burned, death occurred in approximately one and one-half hours both when the rodents were caged and when they were uncaged. These results demonstrate the importance of diffusion. Although only traces of smoke travelled the 20 feet and around a right-angle turn to the window where rats were caged, lethal amounts of carbon monoxide gradually accumulated there. The animals were affected somewhat after 30 minutes, lapsing quietly into unconsciousness at 45 to 60 minutes and death in 90 minutes.

Comparative studies in the simulated burrow with the standard Fish and Wildlife formulation and Mixture A showed that, for equal weights of mixture, the combustion products from the latter were at least three times as toxic to rats as those from the former mix. Sufficient carbon monoxide hemoglobin (79 per cent ave.) was found in the blood of rats freshly killed by the Fish and Wildlife rodenticide to be the sole cause of death.

As a result of these observations, an experimental Chemical Corps rodenticide cartridge was developed. It was similar in design to the Wildlife unit and contained 200 grams of Mixture A. In field tests against woodchucks and also prairie dogs, this rodenticide was found to be approximately 95 and 91 per cent effective, respectively. In comparison, in the field test with prairie dogs the Wildlife cartridge was 83 per cent efficient. Thus, these field tests firmly established the fact that mixtures which generate carbon monoxide are good rodenticides in a confined space of limited capacity.

These results led the Army Center laboratories to study further the problem of carbon monoxide production. Of the many additional formulations tested, one (Mixture B) was the most efficacious in the generation of carbon monoxide, as determined by chemical analysis. For example, it generated two to three times as much carbon monoxide as an equal weight of Mixture A. Chemical analyses also showed that only traces of toxic gases other than carbon monoxide, e.g., oxides of nitrogen, were liberated by the combustion of this new mix.

Mixture B was field-tested against prairie dogs in Colorado in July 1947. The experimental Chemical Corps rodenticide cartridges were made of a 5½ x 1½ or 3½ x 1½ inch pressed-paper cylinder containing 130 or 90 g. of this mixture. Toxicities were compared with the standard Fish and Wildlife cartridge. The results of these well-controlled field studies are given in Table 1.

These data show that all of the cartridges tested were very toxic to the prairie dog under the existing experimental conditions, the lowest percentage kill being 89 per cent. The results compare very favorably with other presently used rodenticides, in the form both of fumigants and of poisoned baits. The Chemical Corps mixture was definitely more lethal than that of the Fish and Wildlife Service. In fact, the 130 g. cartridge killed practically 100 per cent of the prairie dogs.

The importance of generating as large a quantity of carbon monoxide as is economically feasible is underlined by the observation made in several tests that prairie dogs occasionally did not unseal their burrow entrance until the second day after gassing. This was particularly true for the Fish and Wildlife unit. The most likely explanation is that the rodenticide generated sufficient toxic products to incapacitate these animals for at least 24 hours, but not enough to kill them.

The above promising results indicate strongly that a rodenticide cartridge containing Mixture B might also be very effective against woodchucks, rats, ground squirrels, pocket gophers, and other pests which live in burrow systems.

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Acknowledgement

All field tests with prairie dogs were run under the supervision of J. C. Ward and D. A. Spencer of the Wildlife Research Laboratory, Fish and Wildlife Service, Denver, Colorado. John Hamlet of the Wildlife Service supervised the field test with woodchucks. The enthusiastic cooperation and sound advice offered by these men were invaluable to the progress of this research.

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TECHNICAL BRIEFS

From Current Literature in the Sanitary Products Field

Insect Repellents

Dimethyl phthalate, dimethyl carbate, Indalone, and Rutgers 612 are effective against mosquitoes, punkies, black flies, and other biting flies, and chiggers or red bugs. They are safe when used individually or in combination. 2-Phenoxyethyl acetate is safe for use individually. A number of mixtures of repellents are given which are effective against a wider range of insect species and on more individuals than any one of the chemicals when used alone. B. V. Travis, F. A. Morton, and C. N. Smith, U. S. Dept. Agr., Bur. Entomol. and Plant Quarantine E-698 (Revised) 7 pp. (1949).

Particle Size of Aerosols

The particles of nonvolatile materials from aerosols are collected on slides coated with a one per cent alcoholic solution of mannitan monolaurate or a silicon product called "Drifilm 9987." Microscopic measurements are then made of the particles. Volatile materials are collected on slides coated with magnesium oxide or carbon soot. Size estimations are made by measuring the craters left at the point of contact. A. H. Yeomans, U. S. Bur. Entomol. and Plant Quarantine ET-267 (1949).

Fungicide From Peat

Peat is dried, ground, and mixed with soda ash. Experiments indicated that the product is equal to or better than a copper-containing fungicide. K. Oshima, Japanese Patent No. 172,573; through *Chem. Abs.*

Rotproofing Compounds

Tests made on the degree of protection afforded to fibrous material by the use of copper oleate, copper naphthenate, pentachlorophenol and its sodium salt, various creosote-copper naphthenate mixtures, copper tallate, and copper hydrogenated resinate, indicated that the organic radical of the metallic soaps of naphthenic acid has a definite inhibitory effect on certain types of fungoid and bacterial growth, particularly copper-tolerant *Aspergillus niger.*

The results with pentachlorophenol were not good owing to the leaching out of the active material. Hence, derivatives of the compound were developed which were complex combinations of pentachlorophenol with acetic acid, stearic, lauric, and other acids. By means of these derivatives it is possible to incorporate both waterproofing and rotproofing properties in finished emulsions used by the rope and cordage industry. These derivatives have the same degree of inhibitory effects as pure pentachlorophenol, with none of its disadvantages. They are soluble in organic solvents and thus can form solutions with white spirit and other solvents for use in treating ropes and cordage by dipping. F. Fisher, *Fibres, Fabrics and Cordage 15*, 331-2.

Improved Insecticide

A small amount of cyclohexanol is added to sulfonated oil to increase its affinity toward water. This is then added to powdered pyrethrum or derris or to their mixture. K. Takahashi, Japanese Patent No. 172,471; through *Chem. Abs.*

Germicidal Emulsion

A small quantity of fatty acid mixed with orthodichlorobenzene is emulsified with an aqueous bentonite suspension containing dissolved caustic soda. K. Yanamoto, Japanese Patent No. 172,471; through *Chem. Abs.*

Copper Fungicide

A concentrated solution of copper sulfate was mixed with approximately a molecular equivalent of sugar or molasses. The concentrated aqueous solution was added until the resulting mixture became somewhat turbid from the hydroxide formed. The preparation is useful as a fungicide. J. Tobler and M. Landau, Swiss Patent No. 232,541; through *Chem. Abs.*

Fabric Impregnant

Diaryl mercury compounds precipitated *in situ* render fabrics bacteriostatic and fungistatic. For example 1500 grams of phenyl mercuric acetate are mixed with 3750 ml. of triethanolamine and 500 ml. of 80 per cent lactic acid. The latter serves as an inhibitor to prevent spontaneous formation of diphenylmercury. This is dissolved in water, the fabric is treated with the solution and is then heated to precipitate diphenylmercury. F. J. Sowa, British Patent No. 605,442.

DDT Decomposition

The extent of DDT decomposition on dispersion in oil solution by thermal aerosol insecticide generators was determined. Decomposition, in general, was low, and increased gradually with temperature to a maximum of about 17 per cent at 700°F. At the normal temperature of operation of the generator of 600°F. it varied from three to eight per cent. Decomposition was due mainly to the temperature of dispersal, the effect of air being negligible. At the lower temperatures apparently only one chlorine atom was split off each decomposed DDT molecule, and at the higher temperatures, from two to three chlorine atoms split off. The reliability of the chemical analyses for DDT on the oil portions of the samples collected at various temperatures was checked by entomological analysis. J. Goldenson, H. E. Norton, C. F. Nova, and S. Sass, *Ind. Eng. Chem. 41*, 2173-6 (1949).

Insecticidal Paints

Dichloropropane-dichloropropenyl and/or thiocyanates of higher alcohols or other nonvolatile insecticides are mixed with emulsifying agents and added to paint or whitewash to make it insecticidal. Plastifying agents, resins, oils, etc. can be added also. Ammonia-Nova, Italian Patent No. 424,381; through *Chem. Abs.*

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Allethrin . . .

(*From Page* 109)

with allethrin, but to show primarily the comparative effectiveness of allethrin and pyrethrins when each is combined with the synergist at a single ratio. The former comparison would require a much more extensive study involving an initial determination of the optimum ratio of each material with allethrin.

Complete results of this first set of tests are shown in Table 1. The four series of tests were not made simultaneously so that exact comparisons between the synergists are not entirely valid. It will be noted that in all cases knockdown values, particularly at three and five minutes, are somewhat lower for the allethrin-synergist combinations than for equivalent concentrations of pyrethrins with synergist. In each case at least three concentrations of each combination were tested in order to obtain concentration-mortality comparisons of allethrin and pyrethrins with each synergist. These comparisons are presented graphically in Figures 1-4. The concentrations required to produce 50 per cent mortality of house flies were obtained from the graphs. From these

TABLE I

Peet-Grady Tests on House Flies of Pyrethrins and Allethrin with Four Synergists.
Small Group Method; 100 House Flies per Test.

Concentration (mg. per 100 ml.) Pyrethins	Allethrin	Synergist	*No. of Tests*	*Knockdown (percent)* 3 Min.	5 Min.	10 Min.	*Mortality (24 Hrs.) of Knock-down Flies (percent)*
SERIES A.—n-Propyl Isome (1-5 Ratio):							
35	..	175	7	30	48	83	52
70	..	350	7	50	67	91	75
105	..	525	7	58	71	94	86
..	35	175	7	12	22	60	32
..	70	350	7	26	45	77	54
..	120	600	7	31	52	88	69
100 (OTI)	..	..	8	60	69	92	50
SERIES B.—Synergist 264 (1-10 Ratio):							
50	..	500	7	38	53	78	29
100	..	1000	7	55	69	92	53
150	..	1500	7	57	73	95	73
..	50	500	7	24	38	70	32
..	100	1000	7	27	50	84	52
..	150	1500	7	42	68	94	66
100 (OTI)	..	....	9	58	72	93	47
SERIES C.—Sesame Oil Extractives (1-3.75 Ratio):							
40	..	150	7	43	58	91	38
60	..	225	7	43	58	93	58
100	..	375	7	61	77	96	83
..	40	150	7	17	33	69	24
..	80	300	7	33	54	88	46
..	120	450	7	39	55	93	64
..	200	750	7	51	68	95	77
100 (OTI)	..	..	7	54	70	96	55
SERIES D.—Piperonyl Butoxide (1-8 Ratio):							
15	..	120	12	17	35	75	44
25	..	200	11	28	50	86	68
40	..	320	11	45	62	91	76
..	25	200	12	8	21	54	33
..	50	400	11	20	37	68	48
..	100	800	11	32	51	89	77
100 (OTI)	..	..	12	59	71	91	50

TABLE II

Results from Three Laboratories of Peet-Grady Tests on House Flies of Pyrethrins and Allethrin with Piperonyl Butoxide.

Materials.—Pyr.-Butox.: 25 mg. Pyrethrins with 200 mg. Piperonyl Butoxide per 100 ml.
All.-Butox.: 25 mg. Allethrin with 200 mg. Piperonyl Butoxide per 100 ml.

Laboratory	*Method*	*No. of Tests*	*Material*	*Knockdown in 10 Min. (percent)*	*Mortality in 24 Hrs. (percent)*	*Difference in Mortality between Pyr.-Butox. and All.-Butox. (percentage points)*
Lab. A	Large Group	5	Pyr.-Butox.	98	75	
"	" "	5	All.-Butox.	90	32	43
"	" "	5	O.T.I.	98	44	
Lab. B	Large Group	8	Pyr.-Butox.	98	80	
"	" "	8	All.-Butox.	92	50	30
"	" "	4	O.T.I.	97	44	
U.S.I.	Small Group	11	Pyr.-Butox.	86	68	
"	" "	12	All.-Butox.	54	33	35
"	" "	12	O.T.I.	91	50	

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values it was possible to calculate the relative amounts of pyrethrins with synergist and of allethrin with synergist to produce 50 per cent mortality. Both of these sets of values are shown in the figures.

It will be seen that with sesame oil extractives it required somewhat less than twice, with n-propyl isome about twice, and with piperonyl butoxide over twice as much allethrin with synergist as pyrethrins with synergist to produce 50 per cent mortality of house flies. Synergist 264 appeared to be almost equally as effective with allethrin as with pyrethrins at the 50 per cent mortality level, although the slopes of the curves indicate that at higher mortalities definitely more of the allethrin combination would be required. These values for relative amounts required to produce 50 per cent mortality are of academic interest, but for practical purposes the actual concentrations of material required to produce a given mortality must be considered. While exact comparisons between the synergists on the basis of the data presented here are not entirely justified, it is, nevertheless, quite apparent that a consideration of the actual concentrations required to produce 50 per cent mortality would place the four synergists in an entirely different order of usefulness than would be indicated by a consideration only of the relative amounts required.

In order to confirm the results obtained in this laboratory, solutions containing allethrin and pyrethrins with piperonyl butoxide were submitted to two other laboratories for Peet-Grady tests. These solutions, which contained 25 mg. of either pyrethins or allethrin with 200 mg. of piperonyl butoxide per 100 ml., were from the same lot as those used in this laboratory for the tests in Series D, Table 1. Results of tests by the three laboratories are compared in Table 2. In spite of some divergence between the actual mortality values obtained, the difference in percentage points between mortalities with the pyrethrin-butoxide and the allethrin-butoxide combinations was of the same order of magnitude in tests by all three laboratories.

It appears from the work of Schroeder and Berlin (2) of this laboratory and from studies made by other investigators, that the divergence between the effectiveness of pyrethrins and allethrin with synergists against house flies may not be as great in low-pressure aerosols as it is in space sprays. Thus the method of application is another of the many factors that must be considered in any comparative study of this type.

The difference in effectiveness between allethrin and pyrethrins with synergists appears to be more pronounced against roaches than against house flies. Table 3 shows tests, by the direct spray method

TABLE III

Direct Spray Tests on Adult Male German Cockroaches of Pyrethrins and Allethrin with Two Synergists.

Dosage of Spray—0.3 ml.
10 Tests, 20 Roaches per Test

Synergist Used	*Concentration (mg. per 100 ml.)*			*Dead and Moribund (percent)*	
	Pyrethrins	*Allethrin*	*Synergist*	*24 Hours*	*48 Hours*
n-Propyl Isome	93.3	...	466.7	88	89
n-Propyl Isome	...	280	1400	35	36
Piperonyl Butoxide	60	...	300	56	58
Piperonyl Butoxide	...	180	900	32	32
	100 (OTI)	...	...	30	32

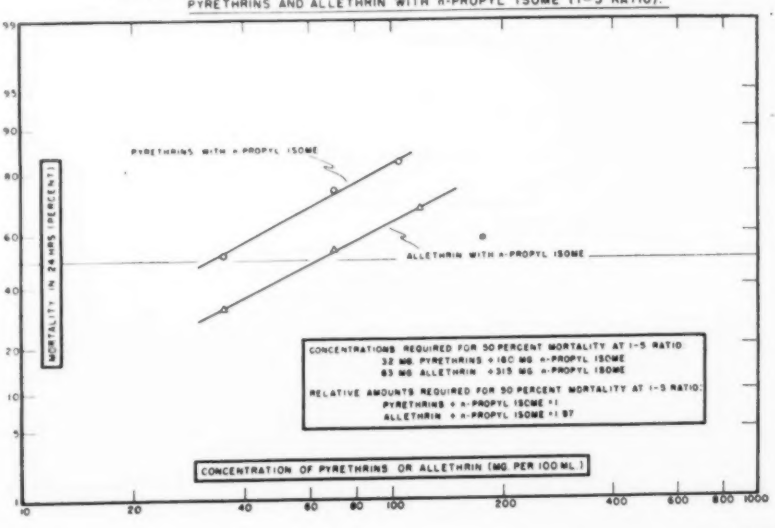
TABLE IV

Surface Deposit Tests on Adult Male German Cockroaches of Pyrethrins and Allethrin with Piperonyl Butoxide.

Deposits on Glass Plates
Exposure Period 30 minutes
4 Tests, 10 Roaches per Test

Dosage (mg. per sq. ft.)			*Knockdown (percent)*			*Mortality (percent)*	
Pyrethrins	*Allethrin*	*Piperonyl Butoxide*	*30 Min.*	*2 Hrs.*	*3 Hrs.*	*24 Hrs.*	*48 Hrs.*
1	..	10	82	88	75	38	38
2	..	20	100	100	98	90	90
..	2	20	0	2	8	2	2
..	4	40	12	50	52	52	52

FIGURE 1 - DOSAGE - MORTALITY COMPARISON, PEET-GRADY TESTS, HOUSEFLIES; PYRETHRINS AND ALLETHRIN WITH n-PROPYL ISOME (1-5 RATIO).



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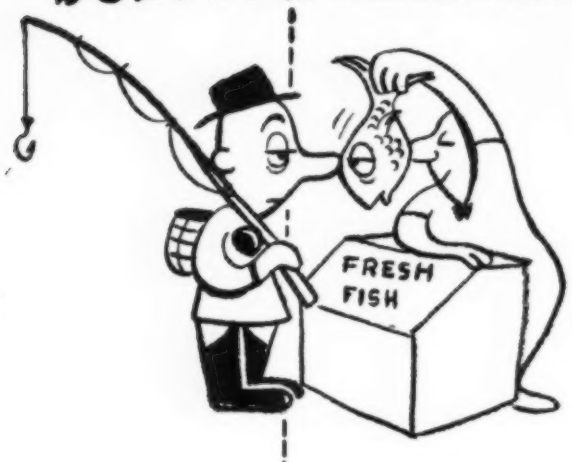

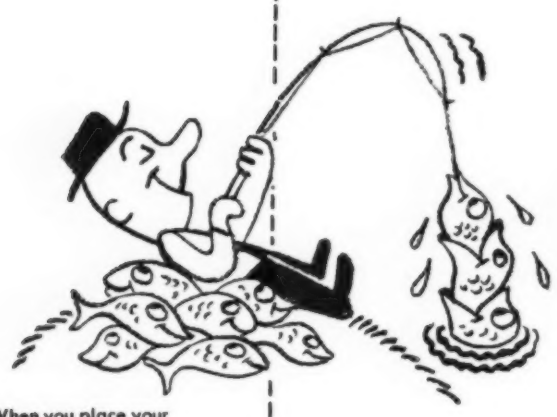

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against adult male German cockroaches, of single concentrations of allethrin and pyrethrins with n-propyl isome and with piperonyl butoxide. Concentrations used were again based on the suggestions of the supplier of the synergist. While exact comparisons are not possible from this limited series of tests, it is evident that even at three times the concentration the combinations of allethrin with synergist did not approach the effectiveness of the combinations of pyrethrins with synergist.

As a further comparison of effectiveness against roaches, a preliminary series of tests was made to determine the effect of surface deposits of allethrin and pyrethrins with piperonyl butoxide on adult male German roaches. Glass plates were sprayed with acetone solutions of the active materials and the deposits allowed to dry for 24 hours. Roaches were confined on the deposit for 30 minutes and then removed for observations of knockdown and mortality. The results are shown in Table 4. These tests show that even at four times the dosage the knockdown produced by the allethrin combination was slower than that of the pyrethrins combination. They also indicate that by this method perhaps three times the dosage of allethrin with piperonyl butoxide is required to obtain the mortality of roaches given by the pyrethrins-butoxide combination.

Other Insects

TESTS in this laboratory have indicated that, against grain insects such as the confused flour beetle and the rice weevil, surface deposits of allethrin with piperonyl butoxide may be less than one-third as effective as those of pyrethrins and piperonyl butoxide. In dusts against certain truck crop insects a combination of allethrin with piperonyl cyclonene was generally less effective than that of pyrethrins with piperonyl cyclonenes, but the differences in effectiveness varied greatly with the insect species. For example, against Mexican bean beetle adults and larvae the allethrin-cyclonene dust gave almost the same mortality as the pyrethrins-cyclonene dust, while against squash bug adults

FIGURE 2-DOSAGE - MORTALITY COMPARISON, PEET-GRADY TESTS, HOUSEFLIES; PYRETHRINS AND ALLETHRIN WITH SYNERGIST 264 (1-10 RATIO).

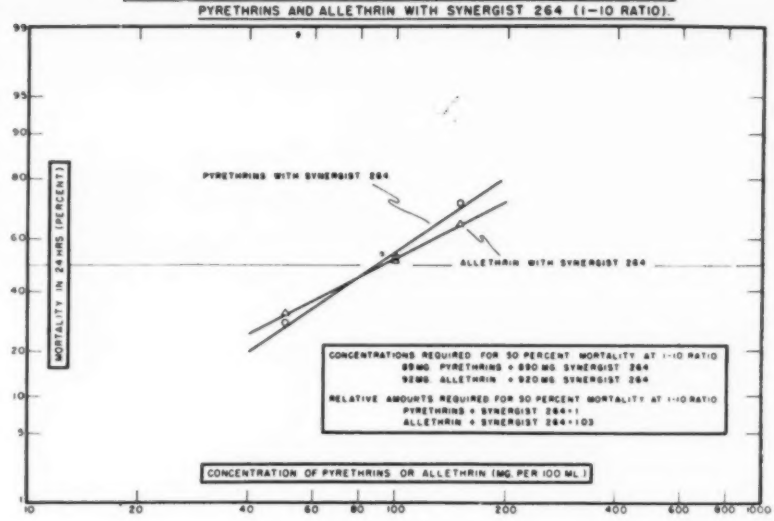

PYRETHRINS WITH SYNERGIST 264
ALLETHRIN WITH SYNERGIST 264
MORTALITY IN 24 HRS (PERCENT)
CONCENTRATIONS REQUIRED FOR 50 PERCENT MORTALITY AT 1-10 RATIO
95 MG. PYRETHRINS + 930 MG. SYNERGIST 264
92 MG. ALLETHRIN + 920 MG. SYNERGIST 264
RELATIVE AMOUNTS REQUIRED FOR 50 PERCENT MORTALITY AT 1-10 RATIO
PYRETHRINS + SYNERGIST 264=1
ALLETHRIN + SYNERGIST 264=1.03
CONCENTRATION OF PYRETHRINS OR ALLETHRIN (MG. PER 100 ML.)

FIGURE 3-DOSAGE-MORTALITY COMPARISON, PEET-GRADY TESTS, HOUSEFLIES, PYRETHRINS AND ALLETHRIN WITH SESAME OIL EXTRACTIVES (1-3.75 RATIO).

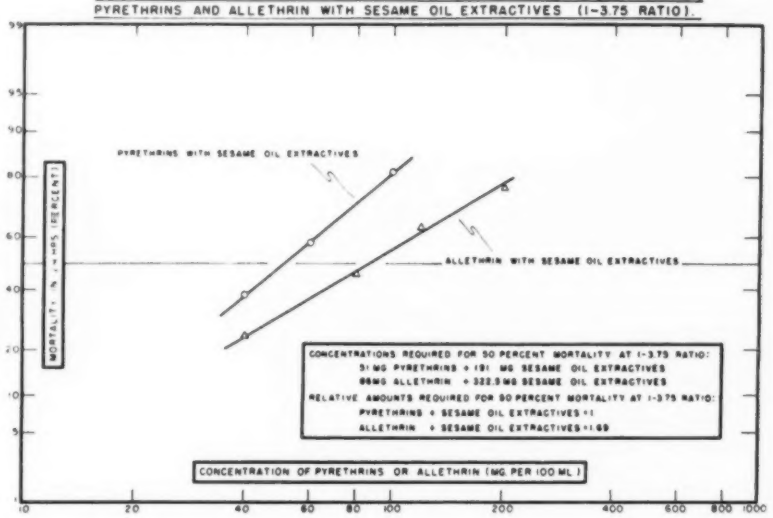
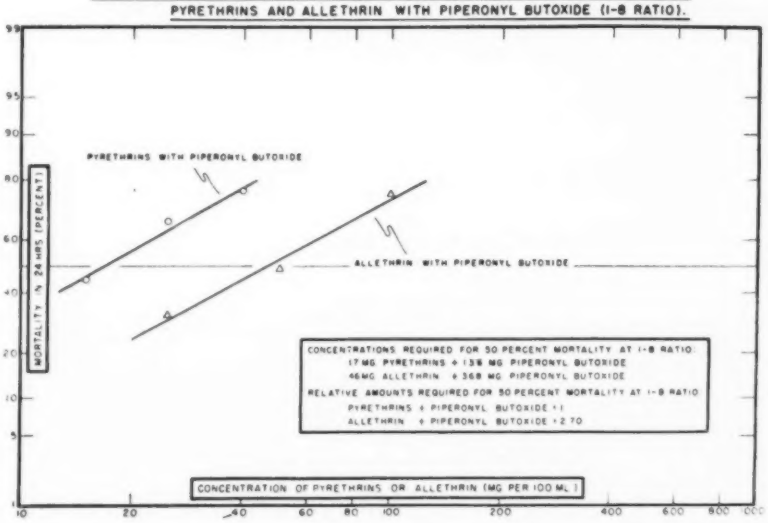

PYRETHRINS WITH SESAME OIL EXTRACTIVES
ALLETHRIN WITH SESAME OIL EXTRACTIVES
CONCENTRATIONS REQUIRED FOR 50 PERCENT MORTALITY AT 1-3.75 RATIO:
51 MG. PYRETHRINS + 191 MG. SESAME OIL EXTRACTIVES
86 MG. ALLETHRIN + 322.5 MG. SESAME OIL EXTRACTIVES
RELATIVE AMOUNTS REQUIRED FOR 50 PERCENT MORTALITY AT 1-3.75 RATIO:
PYRETHRINS + SESAME OIL EXTRACTIVES=1
ALLETHRIN + SESAME OIL EXTRACTIVES=1.69
CONCENTRATION OF PYRETHRINS OR ALLETHRIN (MG. PER 100 ML.)

FIGURE 4-DOSAGE-MORTALITY COMPARISON, PEET-GRADY TESTS, HOUSEFLIES; PYRETHRINS AND ALLETHRIN WITH PIPERONYL BUTOXIDE (1-8 RATIO).


PYRETHRINS WITH PIPERONYL BUTOXIDE
ALLETHRIN WITH PIPERONYL BUTOXIDE
MORTALITY IN 24 HRS (PERCENT)
CONCENTRATIONS REQUIRED FOR 50 PERCENT MORTALITY AT 1-8 RATIO:
17 MG. PYRETHRINS + 136 MG. PIPERONYL BUTOXIDE
46 MG. ALLETHRIN + 368 MG. PIPERONYL BUTOXIDE
RELATIVE AMOUNTS REQUIRED FOR 50 PERCENT MORTALITY AT 1-8 RATIO
PYRETHRINS + PIPERONYL BUTOXIDE = 1
ALLETHRIN + PIPERONYL BUTOXIDE = 2.70
CONCENTRATION OF PYRETHRINS OR ALLETHRIN (MG. PER 100 ML.)

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and nymphs the allethrin combination was very much less effective than the pyrethrins combination. These and other results will be given in a more detailed report on the insecticidal properties of allethrin which will be published later.

Summary

ALTHOUGH the present work represents only a preliminary study of the effects of synergists with allethrin, it is evident nevertheless, that these effects are not equivalent to those obtained when the same synergists are used with pyrethrins.

The comparative effectiveness of allethrin and pyrethrins with synergists varies with the synergist employed, the insect species, the mode of application, and other factors. In general, combinations of allethrin with synergists show a lower order of insecticidal effectiveness than similar combinations of pyrethrins with synergists.

Allethrin must be studied as a new insecticide and no predictions of its usefulness can be made on the basis of previous results with natural pyrethrins.

Literature Cited

1. Stoddard, R. B., and Dove, W. E. Cinerin I Homolog Tested. *Soap and Sanitary Chemicals* 25; (10); 118-21, 161; (1949).
2. Schroeder, H. O., and Berlin, F. D. Allethrin in Aerosols. *Soap and Sanitary Chemicals* (In Press).

Toxicity

(*From Page* 125)

but also is just as important in guiding the manufacturer in protecting the personnel in his plant during the manufacture of the material.

Concerning the proper ethics in publicity on disinfectants in reference to toxicity data may I state the following. It is important that the toxicity data be kept as an aid to the research staff, the chemical staff and the manufacturing staff of an industry. It is to be a guide for the claims made for the end use of a formulation and it is not to be used as a basis for advertising copy. No reputable scientific laboratory will permit its name to be publicized by the advertising department of some company, as having found their product to be less toxic, or safer, or milder, or any other adjective which might be applied to the product. It must be kept in mind that the toxicologist's work is an academic, scientific study in determining the toxicity of a new formulation, or product, or compound, and is a basic contribution. Its publication should appear in reputable scientific or trade journals. The toxicity studies are to be used as a guide to the industry and not as an adjunct to the advertising department.

Lastly may I point out that there is no non-toxic substance. Water is considered non-toxic, but the results are obvious if one would attempt an eight hour exposure to it by inhalation. As mentioned before, we are all fond of seasonings, to varying extents, but a large single dose of a substance as commonly used as sodium chloride would be fatal. And finally the most common substance to which we are exposed is air. It covers our entire bodies, we inhale it, we are bathed in it, and we swallow it, without harm to us, but if we take a few ml. of air intravenously, the results are fatal.

U. S. San. Plant

(*From Page* 113)

low. Potash lye also gravitates by volume graduation to the kettles, so that accurate amounts may be added prior to final laboratory check-up on each batch. Refrigerating and filtering take place on the fourth floor, whence liquids flow by gravity to finished product storage tanks. Banks of storage tanks are located on the shipping floor adjacent to truck and rail shipping doors. They are so novel that some elaboration is pertinent.

Unique Shipping System

IN THE engineering of storage and filling procedures, one aim was to save space and labor. To accomplish this, it was decided to fill most containers just prior to shipment. Through an ingenious system comprising air pressure, piping, valves with electrically operated cut-offs and special scales, drums and five-gallon cans are speedily filled, stenciled and shipped as required. This eliminates tiering, rehandling and the need for storage space.

There are three rows of 1500-gallon tanks in two tiers. As finished liquids flow down from the manufacturing departments, each batch is separated for keying. Transfer from one tank to another is aided by air pressure and tanks are so interpiped that there is great flexibility in shifting from one to another. All pipes converge in a manifold above the scales. Filling is by weight and not volume, so as to compensate for variations due to temperature changes. Reverse type Toledo platform scales automatically disregard the tare of drums and cans. The desired net weight of the liquid is set on the scale dial. As the drum fills, the hand approaches zero, at which point an electric contact instantly closes a solenoid valve, shutting off all flow. This is done in less time than it takes to bring a filled drum from stock. Trucks or railroad cars are loaded with one handling.

Dry mixing is done in large dust-controlled mixers mounted with feed hoppers close to openings in the floor above. They are charged through a system of hoppers and feeders arranged to assure quick and correct weighing. Perfume or other liquids may be sprayed into the mixer, securing rapid, uniform distribution without lumping.

A special punch press, wrapping equipment and other essentials for making deodorant blocks occupy a separate, well-ventilated room, arranged to prevent the escape of contaminating odors into the plant.

The shop for assembly and repair of soap dispensers is located in the four story wing. It is arranged for easy and rapid flow of parts. An ample parts stock room is directly adjoining.

The offices, located on the second floor, have north light and the latest continuous line system of fluorescent lighting. Walls are a soft restful light green.

A board room adjoins the offices and is used also for display of the company's products. Modern washrooms also serve the extra purpose of showing the concern's soap dispensing and odor control systems, which are designed not alone for efficiency, but for eye appeal as well.

Many suppliers and competitive manufacturers who have inspected this new plant agree that it represents the last word in its field.

P. E. A. Business Meeting

A business meeting to discuss cooperative purchasing and the use of a universal service record slip was held by the Professional Exterminators Association at the American Museum of Natural History, New York, recently.

Here's the SIMPLEST WAY to make TOP QUALITY DISINFECTANTS

You can easily obtain disinfectants of high bactericidal efficiency—for use in restaurants, hotels, hospitals, commercial buildings, industrial plants and homes—by using Nopco* 1444 and Albasol* AR, Nopco's outstanding emulsifiers for pine oil.

NO { *heat*, *rosin*, *caustic soda*, *caustic potash*, *—or other chemicals*

SIMPLE HAND MIXING IS ALL THAT IS NEEDED

You have only to add pine oil to either Nopco 1444 or Albasol AR, stir (at room temperature) until a uniform mixture is obtained, and then add water. Special technical knowledge or equipment is absolutely unnecessary.

And the finished disinfectants, you'll find, are not only effective germ killers but—since they are brilliantly clear—are attention-getters, with exceptional sales appeal.

Nopco 1444—is a clear, light amber liquid base, designed to carry 4 parts of pine oil. Soluble pine oils prepared with this base are emulsifiable in either warm or cold water in all proportions. Phenol coefficients of 2, 3, 4, 5, and 5-plus are easily obtained.

Albasol AR—is a special highly concentrated emulsifier, somewhat darker than Nopco 1444. It possesses unusual carrying power for pine oil and blends readily to produce brilliantly clear disinfectants. Formulas giving phenol coefficients of 2, 3, 4 and 5 are easily compounded.

Learn all about these remarkable bases—that make it possible for you to produce top quality disinfectants economically, in the simplest manner ever devised! Fill in the coupon and mail it to us today.

NOPCO CHEMICAL COMPANY
Harrison, New Jersey

Gentlemen:

Please send me full information about Nopco 1444 and Albasol AR bases for Pine Oil Disinfectants.

Name.....

Firm.....

Address.....

City.....Zone.....State.....

*Reg. U. S. Pat. Off.

NOPCO — EVOLVED THRU RESEARCH

NOPCO CHEMICAL COMPANY
Harrison . . . . . New Jersey

"I've handled Rexglo-X and Rex Glo-X Concentrate for five years now, and I know they can't be beat!"

Says:
Detroit Jobber

"Yes, indeed, in five years I've been able to make an honest comparison of nearly all makes of floor waxes, and I've discovered that in practically every case Rexglo-X and Rex Glo-X Concentrate are the best products to sell and the best products to buy.

"I've found that by stressing the outstanding features of Rexglo-X and Rex Glo-X Concentrate, I've got a strong sales story which really convinces my customers! Rexglo-X and Rex Glo-X Concentrate are hard and tough, yet smooth and not brittle. They do not water-spot nor scratch . . . scuff marks are easily removed. Both provide a high gloss finish which outwears ordinary floor wax two to one!"

Write today for complete information on Rexglo-X and Rex Glo-X Concentrate . . . the superior floor finishes.

Rex Cleanwall Corporation
108 South Murphy Avenue — Brazil, Indiana

TRADE NEWS

In New Conn. Chem. Post

Carl Peterson, formerly general manager of Dormeyer Corp., Chi-

CARL PETERSON

cago, was recently elected works manager of Connecticut Chemical Research Corp., Bridgeport, Conn. The position is a newly created one, according to A. O. Samuels, president, who said that it was in keeping with the present expansion program of the company's production facilities as a result of the constantly increasing volume of private packaging.

At one time Mr. Peterson served as vice-president in charge of manufacturing for Varick Machine and Tool Co., New York, and as plant manager for the Lake Success plant of Sperry Gyroscope Co.

Cenol to Alter Claims

Cenol Co., Chicago, has entered into a stipulation with the Federal Trade Commission whereby the company will discontinue certain advertising claims for its insecticide, "1068 Cenol Tensite." The company will stop representing that the preparation, when used in accordance with directions, will kill carpet beetles or that it can be used to kill or control flour beetles infesting flour.

Further, the agreement requires the discontinuance of representations that the product is more effective, by any specifically designated ratio, than DDT in the control of roaches when such relative effectiveness does not apply to actual conditions of use. The company has also agreed to stop claiming that the product has substantially greater effectiveness than DDT in controlling any species of insect other than roaches.

New C.S.M.A. Members

The following firms have been elected recently to membership in the Chemical Specialties Manufacturers Association: General Chemical Division, Allied Chemical & Dye Corp., New York, represented by J. P. Farrell, assistant sales manager; Ninol Laboratories, Chicago, represented by Jerome Kritchevsky, general manager, both active members; Sharples Chemicals, Inc., Philadelphia, represented by Dr. John L. Eaton, supervisor, Use Laboratory; Warwick Wax Co., Long Island City, N. Y., represented by Mauracy Bloch, sales manager, both associate members.

Lipps in Simoniz Post

Charles V. Lipps, formerly eastern division sales manager of Carnation Co., with headquarters in New York, was recently appointed as general sales manager of Simoniz Co., Chicago, it was announced by W. Gardner Barker, executive vice-president. Mr. Lipps had been with Carnation Co. since 1936, prior to which he was with Kirkman & Son, Inc., Brooklyn,

CHARLES V. LIPPS

in a supervisory sales capacity. Mr. Lipps attended Cleveland (O.) College.

Joshel Hyman Treasurer

Dr. Lloyd M. Joshel, purchasing agent of the company since it was

LLOYD M. JOSHEL

formed in 1946, was recently appointed treasurer of Julius Hyman & Co., Denver. He succeeds Harriet S. Hyman. Prior to joining the company, Dr. Joshel was with the War Production Board, in Washington, D. C.

Names Sabath Committee

The appointment of the seven-man committee called for in the Sabath resolution (H. Res. 323) to investigate the use of chemicals in the production and processing of foods, which was passed by the House last month, was appointed recently by Speaker Sam Rayburn. Rep. James J. Delaney of New York, who sponsored the resolution on the house floor for the rules committee is chairman of the investigating group. Other members include: Thomas G. Abernethy of Mississippi; E. H. Hedrick of West Virginia; Paul C. Jones of Missouri; A. L. Miller of Nebraska, and Gordon L. McDonough of California.

Join Continental Filling

The addition of two new chemists to its laboratory staff was announced reecntly by Continental Filling Corp., Danville, Ill. Clarence P. Clapp, a 1949 graduate in chemistry of the University of Illinois, formerly in the microanalysis department or

Clark Microanalytical Laboratory, Urbana, Ill., and S. J. Campbell, a chemistry teacher in the Giraud (Ill.) High School, are now with the firm. Both men are Navy veterans.

Mr. Campbell majored in chemistry at Eastern Illinois State College, from which he was graduated in 1948. He also attended the University of Cincinnati.

Covert Duties Expanded

Ross Covert, vice-president in charge of west coast operations for Boyle-Midway, Inc., New York, was recently elected vice-president and a director of American Home Foods, Inc., another division of American Home Products Corp., New York.

In making the announcement of Mr. Covert's appointment, Walter Silbersack, president of American Home Products, pointed out that sales and production forces of Boyle-Midway and American Home Foods will remain separate, with Mr. Covert directing both the household and food divisions on the Pacific Coast.

At one time Mr. Covert was head of Antrol Laboratories.

New Sanitary Supply Firm

The formation of Jani-tor Co., Tulsa, to serve industrial plants, office buildings and commercial firms with sanitary supplies, chemicals, floor finishes, floor machines, brushes and specialty items pertaining to the maintenance field, was announced recently.

The three owners are Joe C. Greenig, R. H. Kirkley and W. R. Charon. Mr. Greenig had been associated with Dixie Cup Co. in the Tulsa area; Mr. Kirkley has been a salesman for the past 18 years for Tulsa Paper Co., with which firm Mr. Charon had been associated for the same length of time, recently as purchasing agent.

R. H. KIRKLEY J. GREENIG W. R. CHARON

All three men are actively associated in the business which is located at 601 South Peoria Ave., Tulsa.

Hoffman Golf Tournament

The annual golf outing of F. W. Hoffman & Co., Philadelphia sanitary supply firm, was held July 21, at Reading (Penna.) Country Club. Approximately 75 persons attended the affair, which included a dinner following the day of golf. Among the suppliers and manufacturers present was Leo J. Kelly, executive vice-president of the National Sanitary Supply Association, who has been visiting in the East.

Group photo taken at the Hoffman outing, for which John Morris, manager of the firm's Reading branch was host, shows among others: Frank Hoffman shaking hands with Phila. Municipal Court Judge Adrienne Bonnelley, master of ceremonies; Jay Zucker, who flew in from Cleveland for the affair; Leo Kelly, executive v.p. of the N.S.S.A., and to the left of him, Martin J. Peters of Moore Brothers Co., New York.

Mackinon NYQ Sales Head

Barclay E. Mackinon, a vice-president since 1949, was recently appointed general sales manager of New York Quinine and Chemical Works, Inc., Brooklyn. In his new post he is acting directly under Francis J. Reid, executive vice-president, in general organizational matters and is largely responsible for the development of sales of pharmaceuticals and other products. He joined the firm in 1933.

NPCA Meets in Cinn.

The 1950 annual meeting of the National Pest Control Association will be held Sunday through Wednesday, October 22-25, at the Netherland-Plaza Hotel, Cincinnati.

NAC Fall Meeting

The fall meeting of the National Agricultural Chemicals Association will be held Sept. 6, 7 and 8, at the Essex and Sussex Hotel, Spring Lake, N. J.

F.T.C. Cites Insecticides

BOSTWICK LABORATORIES, INC., Bridgeport, Conn., recently was charged by the Federal Trade Commission with misrepresenting four of its insecticides. The complaint cites advertising claims made concerning the effectiveness of the pesticides, and also charges as deceptive certain unqualified safety claims of the insect sprays. Products mentioned in the citation are "Hep Aerosol Insect Killer," "Bostwick Super-Aerosol Insect Killer," "Bostwick Safe-lex Insect Killer" and "Bostwick Moth Proofer."

According to the F.T.C., the company has advertised that "Hep" is safe and will not cause injury to humans, birds, fish and other pets; that "Super-Aerosol" is non-toxic and safe when used in the presence of humans, plants and animals; and that "Safe-lex" is nonpoisonous and safe for use and will not stain or discolor materials which it contacts. These claims, the complaint states, are true only if the products are used "strictly in accordance with the directions," which prescribe precautions necessary to avoid possible injury. Contrary to representations made concerning "Safe-lex," the complaint adds, it may be harmful if sprayed over the heads of children and pets, or over food.

Other claims found by the Commission to be misleading are to the effect that "Hep" will kill all flying insects in the treated premises; that "Super-Aerosol" keeps premises free of flying and crawling pests and kills insects quicker than other insecticides; that "Safe-lex" will destroy all flying and crawling pests; that because of its methoxychlor content, it kills practically every household insect twice as fast as DDT preparations; and that it is safer for use under all circumstances than all other insecticides; that DDT has been barred for use near children and pets; that the Department of Agriculture has recommended that methoxychlor be substituted for DDT to control insect pests; and that methoxychlor kills more insects than DDT.

Actually, the complaint states, these products cannot be depended upon to keep premises free from insects, as claimed; "Super-Aerosol" will not kill insects in a significantly quicker time than many other insecticides; the killing action of methoxychlor is not significantly quicker than DDT; and there are other insecticides which are as safe to use as "Safe-lex."

The complaint also declares that DDT has not been barred for use near children and pets and, except for spraying dairy cows, the Department of Agriculture has not recommended that methoxychlor be substituted for DDT. The Commission further points out that it is not true that methoxychlor preparations possess greater effectiveness than DDT preparations as to all insects because while methoxychlor preparations are more effective against certain species, there are others against which DDT preparations are more effective.

The complaint charges as deceptive claims for the "Bostwick Moth Proofer" that it is effective in protecting garments from moth damage for a year and is the only preparation on the market which mothproofs. The fact is, the F.T.C. complaint states, that the Bostwick product "is not ordinarily effective in protecting garments from moth damage for a year because * * * * its effectiveness is destroyed when garments previously treated are washed or dry cleaned."

Characterizing these practices as "unfair and deceptive," in violation of the Federal Trade Commission Act, the complaint says that they have the tendency and capacity to deceive the public and have resulted in unfair diversion of trade from competitors.

The company is allowed 20 days to file answer to the complaint. The initial hearings have been scheduled before Trial Examiner Abner E. Lispcomb in Washington, August 28.

◆

Canco Advances Madge

The election of George J. Madge as comptroller of the American Can Co., New York was announced recently by C. H. Black, president. Mr. Madge, who first started with the container manufacturing company in 1912 as a messenger boy, had served as assistant comptroller since 1940. Following his first job as

GEORGE J. MADGE

messenger, Mr. Madge became a clerk in the auditing department and later rose successively to a number of posts in that department, being named assistant auditor in 1938.

◆

Maintenance Show Dates

The second Plant Maintenance Show and Conference is scheduled to be held Monday through Thursday, Jan. 15-18, 1951, at the Auditorium, Cleveland, it was announced recently by Clapp & Poliak, Inc., New York, managers of the exposition. So far, 120 companies have leased booth space exceeding by 61 per cent the total area used for the first show.

◆

Okey Chemical Sterilization

Chemical sterilization of milk plant and dairy equipment has been approved for Washington, D. C. by the U. S. District Commissioners after hearings before a Congressional Committee heade dby Senator Guy M. Gillette of Iowa. Attempts to confine dairy sterilization to the use of steam culminated in a bitter newspaper advertising controversy in Washington. Several leading American bacteriologists and public health experts presented briefs in behalf of chemical sterilization indicating wide acceptance in the U. S.

Three Visit Europe

Three well known figures in the sanitary supply industry have visited Europe recently. Two of them, Harold Berliner of Hockwald Chemical Co., San Francisco, and Roy E. Moore of Moore Brothers Co., New York, visited the Continent as official representatives of the Amateur Athletic Union. Mr. Berliner visited Stockholm, Sweden, and other Scandinavian countries with an A.A.U. track team, while Mr. Moore was in Basle, Switzerland on A.A.U. gymnast team business.

Earlier in the year he had visited Japan with three A.A.U. gymnasts, and had an interview with General MacArthur. During that trip he received the keys to the city of Yokohama. Mr. Moore is currently returning to the U. S. via Holland, Belgium and England, whence he will board the *Queen Mary* for a return trip to the States. Some time this fall his itinerary on behalf of the A.A.U. includes a flying trip to Brazil.

The third member of the traveling trio of sanitary supply men is Albert Selig, of Selig Co., Atlanta, who sailed recently for England and the Continent aboard the *Queen Mary*. Mr. Selig is expected to demonstrate (for a fee) his mastery of an American card game known as gin rummy.

Lifts Tin Allocation Order

The revocation of Allocation Order M-43, covering tin, was effected June 30, 1950, by the Office of Industry and Commerce of the U. S. Department of Commerce.

Hercules Earnings Up

An increase in its net income for the first six months of 1950 was reported recently by Hercules Powder Co., Wilmington. In the first half of 1950 a net income equal, after payment of preferred dividends, to $2.34 a share on 2,654,138 common shares, as compared with $1.77 a share on 2,644,789 common shares in the 1949 period was reported. Sales for the first half of this year were $71,056,149, as compared with $60,406,197 for the 1949's first six months.

Frank Meguiar, Jr., is Dead

Frank Meguiar, Jr., 71, president and founder of Mirror Bright Polish Co., Pasadena, Calif., died July 14. He leaves eight daughters, four sons, 30 grandchildren and 14 great-grandchildren.

Pennsalt Appointments

J. Gordon Simpson was recently appointed district sales manager for the Western territories of the B-K and household products department of Pensylvania Salt Manufacturing Co., Philadelphia.

Another Pennsalt change involves Alfred N. Young, who has been appointed sales-service representative of the company's special chemicals department in the St. Louis area. He succeeds Charles R. Sorber, Jr., who was recently transferred to the Cincinnati territory. Mr. Young was formerly connected with Harrison Lumber and Hardware Co., St. Louis, prior to which he was with the sales department of the Grasselli Division of E. I. du Pont de Nemours & Co.

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MULLIGAN ROBINSON PICKARD MARSHALL

Robinson, Wagner Changes

Changes in its staff, including the appointment of John C. Robinson as vice-president in charge of production at the Mamaroneck, N. Y. plant, and the election of Joseph C. Pickard as secretary and a director, were announced recently by Robinson, Wagner Co., New York lanolin producers.

Mr. Robinson, a director since 1944, formerly engaged in research and development work for the company. Mr. Pickard, an Army veteran, who served as an officer in World War II, has been with the company since 1945 in a sales capacity.

Arthur A. Mulligan, formerly with Lehn & Fink Products Corp., New York, for 10 years, has been named assistant to the president and assigned to market research. He is a graduate of Fordham University, served as a Major in the U. S. Army during World War II, and was one of the founders and first president of the Cosmetic Industry Buyers and Suppliers Association.

Robinson, Wagner has also announced the appointment of Robert C. Marshall as sales representative for the Philadelphia area. Previously he held a similar position with another lanolin firm.

Mr. Robinson is a graduate of Sheffield Scientific School of Yale University and has developed processes for the commercial production of a number of new lanolin derivatives.

Chlordane at Chem. Show

An exhibit featuring chlordane and packages for insecticides containing chlordane is to be a highlight of the exhibit of Velsicol Corp., Chicago, at the Sixth National Chemical Exposition, being held under the auspices of the Chicago Section of the American Chemical Society at the Colliseum in Chicago, Sept. 4-8. Labels and lithographed containers of chlordane insecticides are being solicited from insecticide manufacturers by Velsicol for use as part of the exhibit.

Warfarin for General Sale

The release for general consumer sale of warfarin, the anticoagulant rodenticide formerly designated as W.A.R.F.—42 and Compound 42, was announced recently by Ward Ross, general manager of Wisconsin Alumni Research Foundation, Madison. The rodenticide, developed in the laboratory of Dr. Karl Paul Link of the University of Wisconsin, kills rats and mice by producing hemorrhage. It is a slow acting material that requires consumption over several days to kill. Patents on warfarin are owned by Wisconsin Alumni Research Foundation. The material is manufactured and distributed by S. B. Penick & Co. and R. J. Prentiss and Co., New York.

A large-scale testing program with the rodenticide has been underway for some time by the two companies and the Foundation in cooperation with the Production and Marketing Administration of the U. S. Department of Agriculture, the Fish and Wildlife Service of the U. S. Department of the Interior, the U. S. Public Health Service and the National Pest Control Association.

Warfarin is claimed to be particularly successful in controlling both Norway and roof rats as well as mice, based on several hundred field tests carried out in a nationwide testing program that began in September 1949.

DDT Against Termites

A single treatment of DDT gives complete protection to wood in contact with soil for at least five years, according to a recent release of the U. S. Department of Agriculture, Washington, D. C. Experiments conducted for many years by entomologists of the Bureau of Entomology & Plant Quarantine, U.S.D.A., indicate that five per cent DDT in No. 2 fuel oil gives a satisfactory anti-termite material. The insecticide is applied to the soil surrounding wooden structures needing protection at the rate of one quart per cubic foot of soil.

A. O. Samuels, second from right, president of Bostwick Laboratories, Bridgeport, Conn., and H. R. Shepherd, vice-president in charge of research, examining five millionth can of "Hep" aerosol insecticide coming off production lines.

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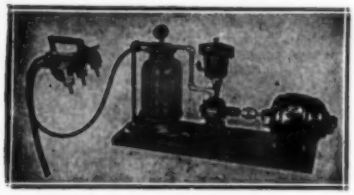

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N.Y. Sanitary Supply Meeting

A SPECIAL evening dinner meeting of the New York area members of the National Sanitary Supply Association was held July 19, at the Washington Inn, New York. Jacob Kahn of Windsor Wax Co., Hoboken, N. J., eastern regional vice-president of the N.S.S.A., presided at the meeting, arrangements for which were handled by Martin J. Peters of Moore Brothers Co., New York.

A discussion of current and future activities of the National Sanitary Supply Association by Leo J. Kelly, executive vice-president, and the showing of two films on floor care were the highlights of the meeting. A sound motion picture on care and maintenance of wood floors, produced by Huntington Laboratories, Huntington, Ind., and two sound, color, slide films of S. C. Johnson & Son, Inc., Racine, Wis., on wood and rubber and asphalt tile floor care were presented.

An up-to-date review of the paper situation was given by William Franklin of Hudson Paper Co., New York. He pointed out that there has been some "scare buying" in the paper industry in the past three weeks. Many distributors are ordering 90 day supplies of paper, whereas normally they buy a 30 day supply, he said. Naturally, this has tightened up supplies.

He recommended that distributors associate themselves with integrated mills, which he defined as those having their own land, timber and pulp producing facilities. He indicated that if the present situation worsens, converters may be caught in the squeeze. Kraft paper for paper towels, etc., will be most difficult to secure, the speaker stated, advising that distributors order a 30 day inventory supply, plus 35 per cent of their normal requirements to cover their needs. This should be protection in the case of slow deliveries, etc., Mr. Franklin said. On white paper, for tissues, etc., the supply picture seems better, he stated. Distributors were advised to buy 30 day inventory supplies of white papers, plus 30 per cent.

The foregoing advice, Mr. Franklin said, applies if the situation in Korea does not spread. If theatre of conflict expands, then his advice might no longer be valid, the speaker stated. Should the government, the largest consumer of paper, suddenly increase its demands, the whole situation could change radically, according to Mr. Franklin. He concluded that no mill is going to allow the speculative buying that took place during World War II.

In his discussion of association activities, Leo J. Kelly told the 35 persons present that the National Sanitary Supply Association had engaged the services of William Rados, sales consultant, as a consultant in the production of sales training material and films. Mr. Rados will be paid $2200 for this work, Mr. Kelly said. He pointed out that the funds in the association's treasury are sufficient to sustain the organization for at least two years if worse comes to worse. He also indicated that while the association feels it has enough members at the present time, in case of a widening of hostilities, a larger membership would be helpful in securing greater consideration should certain essential raw materials be allocated by the government. Size and influence were factors in obtaining fair treatment in the question of allocations during the past war, Mr. Kelly stated.

He singled out a number of those present as contributing of their time and effort to the work of the National Sanitary Supply Association, and cited as evidence of the association's progress its growing recognition by government and municipal authorities, the general public and the attention given it by the trade press.

Copies of the association's recently adopted code of ethics were distributed at the meeting. Large size, two-color copies suitable for framing will be mailed to all members at a later date, Mr. Kelly said.

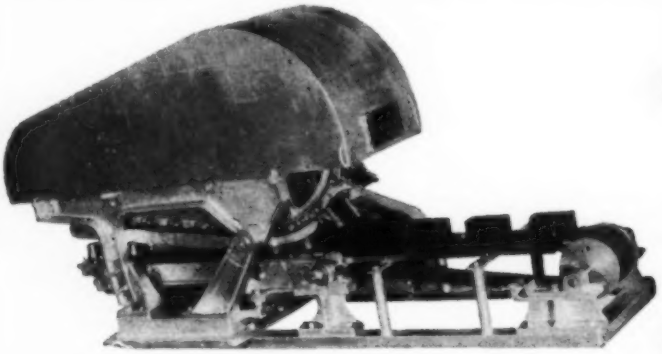
Plans for future meetings were discussed and some of those present suggested that salesmen of distributor firms be invited to meetings.

New Mothproofing Com.

"Moth-Aseptic," a new mothproofing compound, was announced recently by Penn-Aseptic Corp., Mamaroneck, N. Y. A concentrated material, the compound can be mixed either with water or dry cleaning fluid. One ounce of base material is recommended to make a quart of mothproofing solution. A booklet on "Moth-Aseptic" is to be issued shortly.

Brayton Eddy Dies at 51

Brayton Eddy, 51, curator of reptiles and insects for the New York Zoological Society for the last five years and one of best-known entomologists in the U. S., died suddenly July 17. He was a graduate of Brown University. Later he took advanced courses in entomology at Cornell. He established the first insect zoo in the United States at Goddard Park in Providence in 1935. For six years before joining the New York Zoological Society he had served as administrator of entomology and plant industry for the State of Rhode Island.



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Two Join Ponsell

Ponsell Floor Machine Co., New York, has announced appointment of J. W. Spenser as general sales manager and L. C. B. Laurie as assistant sales manager. Mr. Spenser has been in the floor maintenance and supply industry since 1929 and came to his new post from the Franklin Research Co.

Mr. Laurie, an Englishman by birth, has had experience in business lines in South America and elsewhere and was lately an industrial consultant for the Commerce and Industry Association of New York City. He recently returned from seven months abroad, for study of post-war European markets for sanitation equipment.

Md. Inspection Report

The official report of the Maryland Inspection and Regulatory Service, College Park, Md., covering insecticides and fungicides, was issued recently. The report, which is published quarterly, is dated April, 1950, and bears the issue number, 214.

Hercules Advances Three

Three members of the administrative sales staff of the synthetics department of Hercules Powder Co., Wilmington, were recently advanced to new posts.

Henry Thouron was made director of sales; B. H. Little was named district sales manager of the department's Boston branch office and Howard C. Bates was appointed special representative in New England.

Pulva Names Williams

Pulva Corp., Perth Arboy, N. J., manufacturers of pulverizing machinery, recently announced the appointment of Williams Sales Co., Cincinnati, as its exclusive representative in Ohio, Michigan, Kentucky, West Virginia and Western Pennsylvania.

"Dura-Sorb" Mop Offer

To introduce their "Dura-Sorb" wet mop, made of cellulose yarn, American Standard Manufacturing Co., Chicago is supplying customers with one mop free of charge, it was announced recently. Because of its tensile strength the cellulose yarn is extremely durable, according to the maker, and can be used on the roughest of floors. The yarn, which is spun like cotton, absorbs both moisture and dirt rapidly.

Show Features Bugs

Sketches of bugs, created in the Walt Disney style, with sculptured heads were used in a recent experiment on sales merchandising methods for "Aer-a-sol" products made by Bridgeport Brass Co., Bridgeport, Conn. The bugs were characters in a musical called the "Bug Circus" and were presented three times nightly at a recent exposition in Stratford, Conn.

Spitz 25 Yrs. at Newport

R. J. Spitz, sales manager of Newport Industries, Inc., New York, on June 18 completed a quarter of a century of continuous service with the firm. The company is the oldest steam solvent naval stores organization in the industry. Mr. Spitz started in the technical sales division of the company.

Medl Joins Quaker Chem.

Robert C. Medl, formerly vice-president and technical director of McCormack-Medl Corp., Camden, N. J., recently joined the staff of Quaker Chemical Products Corp., Conshohocken, Pa., as technical director.

Para as a Fungistat

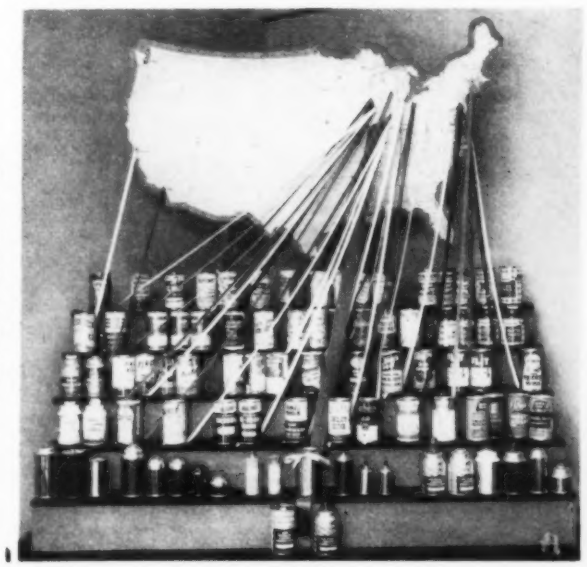
An eight-page illustrated bulletin, describing laboratory and field studies of paradichlorobenzene as a volatile fungistat, is available from Monsanto Chemical Co., St. Louis, it was announced recently. In addition to properties and specifications of paradichlorobenzene, the bulletin includes a summary of previous work, use recommendations and a bibliography.

American Floor Specs.

A file of specifications on the preparation, finishing and maintenance of floors was completed recently by American Floor Surfacing Machine Co., Toledo, O. The data is compiled in loose-sheet form and covers wood, cork, concrete, terrazzo, asphalt, rubber and plastic tile, and linoleum. It is divided into five sections devoted to the preparation, maintenance, selection of finish, floor data, and specification sheets.

Cyanamid Fumigant Folder

A special, four-page folder on its "Cyanogas G-Fumigant" was issued recently by American Cyanamid Co., New York. How the fumigant is applied, its advantages, methods of fumigation and types of applicators are covered in the folder. In addition, there is a dosage table and information on the use of "Cyanogas A-Dust" for rats and mice.



New chemical specialty products in aerosol packages and new aerosol packages for established products were shown at the mid-year meeting of Chemical Specialties Manufacturers Association at the Hotel Drake, Chicago, recently by Continental Filling Corp., Danville, Ill.

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Crown Wax No.	Melting Point °F	Penetration 100 g., 5 sec.	Color N. P. A.	Acid Number	Saponification Number
23	180/185	6 max.	6 max.	20-25	55-65
36	180/185	8 max.	8 max.	30-35	85-95
1035	195/200	2 max.	2½ max.	Nil	Nil

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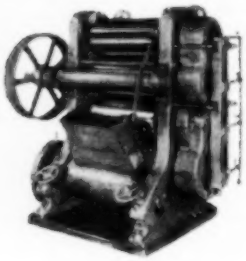

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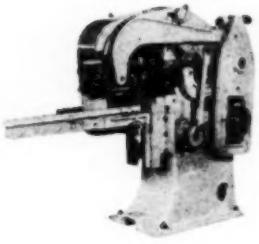

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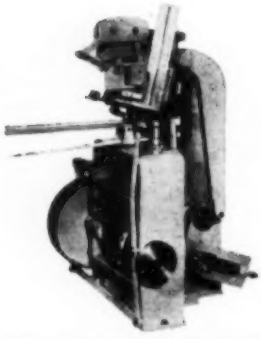

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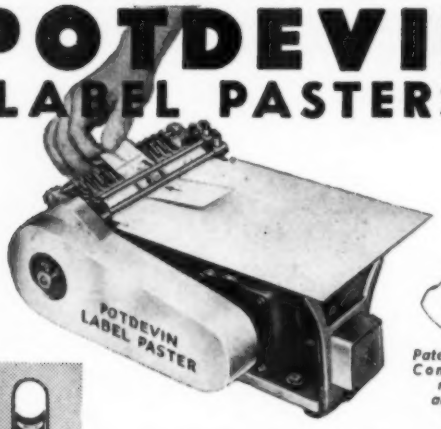

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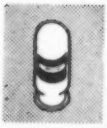

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For Sale: Mikro pulverizers #1SH, 3HP. Other sizes. Allbright-Nell 4'x9' chilling rolls. Lehmann 4 roll W.C. 12"x36" steel mill. Houchin 8½"x16" 3 roll & 18"x30" 4 roll Granite Stone Mills. Anderson No. 1 Expellers. Jack. kettles & tanks, iron, copper, alum., stainless. Dryers vac & atmos. Jones automatic soap presses. Soap frames. Automatic soap chip dryer. Slabbers & cutting tables hand & power. Crutchers. Blanchard #14 soap powder mill. 6 knife chipper. Foot presses. Filter presses 12" to 42". Wrapping & sealing machines. Powder, paste & liquid mixers. Rotex sifters. Filling machines. Grinders. Hammer mills. Mikro pulverizers. Colloid mills. Three roll steel mills, 3"x9", 9"x32", 12"x30" & 16"x40". Portable elec. agitators, pumps, etc. Send for bulletin. We buy your surplus equipment. Stein Equipment Co., 90 West St., N. Y. 6, N. Y. WOrth 2-5745.

For Sale: Two 200 gallon full jacketed Dopp Kettles with type "L" Agitator. Also other chemical equipment. Allied Steel & Equipment Co., Dept. W., Chester, New Jersey.

For Sale: J .H. Day, double arm sigma blade mixer 24"x18" deep, tilting discharge. Plant Equipment Co., Cincinnati 3, Ohio.

For Sale: 2 Crutchers 36" dia. x 40" deep. Powder mixers 800# to 1500#. Stokes & Smith G-I-D Powder filler. Stainless steel tanks from 6 gal. to 6700 gal. Perry Equipment Corp., 1510 W. Thompson Street, Phila. 21, Pa.

For Sale: 1 — Proctor & Schwartz 4-section Soap Chip Dryer, with 5 roll Houchin Cooling Rolls; 1—Pkge. Mach. Co. N-1 Laundry & Toilet Bar wrapping machine; 1—Houchin hand soap slabber; 1—3500 lb. vertical jacketed crutcher, m.d., 1—Houchin 4-roll inclined Granite Mill, 18" x 30" rolls, pulley drive; 2—Jones vertical type B, toilet soap presses; 3—Houchin 3" soap strainers; 50-1200 lb. soap frames; 2—Sperry 36" x 36" recessed filter presses, 60 plates; 1—Dopp cast iron 600 gallon jacketed kettle; 1—Allbright-Nell 4' x 9' Chilling Roll. Only a partial list. Send us your inquiries. Consolidated Products Co., Inc., 15-21 Park Row, New York 7, N. Y., Barclay 7-0600. Cable address: Equipment, N. Y.

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New Mop Wringer-Pail

A new mop wringer combination featuring a stainless steel pail and "Squeeze-Easy" wringer was an-

nounced recently by Market Forge Co., Everett, Mass. The stainless steel pail is mounted on two inch solid rubber casters.

The wringer designed for other types of pails, as well, is said to be lightweight and sturdy as a result of its one-piece construction. It has a leverage ratio of 20 to one. A back floating plate slides forward to wring both large and small mops. Louvres are designed to prevent water from splashing out.

H. J. Henry C.S.C. V.P.

The appointment of Harold J. Henry as vice-president in charge of sales for Commercial Solvents Corp., New York, was announced recently.

Measuring Foam

(*From Page 41*)

at all times. Several of the twenty openings may become clogged and show up a constant error in the experimental work. After considerable work with all types of liquid soaps, it was found that quality comparisons of foaming power between soaps could be made.

As it was stated in the beginning of this paper, the emphasis is placed on information valuable as aids to advertising and sales rather than as scientific data. Again it must be stated that a proven good foaming power does not necessarily imply good cleaning power or detergency.

The immediate problem that faced our laboratory was that field test reports and laboratory work did not always check. For example, we produced a low priced scrub soap which in the laboratory seemed to have better foaming power under our old method of test than a higher priced and superior quality scrub soap. Obviously, since field tests repeatedly showed the reverse to be true, there must have been a fault or incorrectly placed emphasis in the laboratory testing.

In attempting to overcome these conflicting results, a "VSQ" factor was established which is derived from the terms volume, stability and quality. The component volume of "VSQ" may be measured through the use of the shaker or the dynamic foam meter. The stability term may be measured conveniently as a part of the shaker test and the quality may be measured by visible means from either test. This "VSQ" factor may be rated on any standards which please the laboratory doing the work, but it is always possible to establish qualitative comparisons between products by establishing a set of curves and factors for each group of products tested. It was found in our laboratory that the simplest way of establishing comparative "VSQ" factors was to run the shaker test, observe the foam decadence, and then determine the rate of formation from the dynamic foam meter. Using only these simplified data, it was possible to read from established charts a "VSQ" factor directly. It is necessary only to determine the slope and position of the curve plotted as a result of the dynamic foam test, the relative stability readings, and an estimation of the bubble size in order to read from the established charts of known data.

As illustrated in Figure F, two products exist which give unusual results. Sample A shows a much higher dynamic foam rating but is given a lower "VSQ" factor than B due to the fact that the stability and quality measurements were poor. This alone shows how a misleading conclusion can be made from one laboratory test as compared with overall results from field testing. It is possible to assign different "VSQ" factors if the laboratory doing the work wishes to place an overbalanced weight on any one particular term. It is not unusual for a difference of 25 per cent to exist in the "VSQ" factor for two liquid scrub soaps which are similar in every other respect.

The entire research project undertaken here has indicated that foam measurements are of little value as a quantitative control but seem to be useful with the proper interpretation as quality control. There can be no standard procedure for establishing "VSQ" factors until the theories between foam formation and breakdown are more completely understood and explained from both a theoretical and practical viewpoint. Until that time, it is the sincere hope of the writer that the methods described in this paper will be of assistance in foam measurement and analysis.

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Perfuming Soap

(*From Page 35*)

	Parts by weight
Petroleum sulfonate	100
80% K-tall oil soap	100
Isopropenol	50

This combination is practical in its application, as it has only to be mixed with perfume and water in order to turn almost any perfuming material

into a high percentage stock solution. The results in solubilizing several alkali resistant substances with this mixture are shown in table III.

It may be seen that small molecules having only one benzol ring and one small radical accommodate themselves easily to the base, which is clearly soluble in any amount of water. Alkyl side chains of benzol rings attach themselves also to fatty acid soaps, provided these side chains are not too short. Anisic aldehyde, having the methoxy group in the para position and with a disturbed benzol ring-magnetic field, does not satisfy the charge by combining with the base. Octyl alcohol and geraniol, an olefinic terpene alcohol, react similarly.

Third Base Described

BY removing the petroleum sulfonate from this base and using monoethanolamine laurate as a substitute, without changing the solubilizing proportions of 15 cc base, 5 cc perfume and 10 cc water, satisfactory results are obtained, as illustrated in table IV.

Bromstyrol, solubilized by the second method, dissolves clear in any amount of water, but since it is not very compatible with the alkyl group of the coconut oil soap, present in the third method, it becomes cloudy by further dilution with water in this method. Octyl alcohol, in the third method, finds medium length alkyl groups more compatible with its molecule, and is solubilized in diluted 15 per cent coconut oil soap.

For specific purposes, such as theater sprays and similar spray deodorants, only a small amount of emulsifying agent and a somewhat cloudy appearance of the perfume solution is desirable. In such cases, it is advisable to obtain the correct emulsifying agent. It is further recommended that the minimum percentage necessary to effect a clear solubility in any amount of water be used, and the amount of emulsifying agent required be reduced to about 50 to 75 per cent. The addition of a $CaCl_2$ solution, reacting with alkali soaps and forming insoluble calcium soaps, causes turbidity.

By selecting compatible emulsifying agents and in the right amount, any perfume blend, essential oil and aromatic chemical can be solubilized clear in water. The problem of solubilizing large, highly hydrophobic molecules such as lanolin, cholesterin, lecithin, vitamins and similar structures is more difficult.

Lanolin consists chiefly of cholesteryl and isocholesteryl esters of the higher fatty acids. To solubilize lanolin, contact has to be made by two emulsifying agents, one with an alkyl group of C_{12} to C_{18} length and the other one with a benzol ring structure of the rosin acid type. These must be heated to about 175°F. Emulsifying agents with small molecules are not able to effect a lasting grip on the two hydrophobic ends of the lanolin molecules. Both emulsifying agents turn hydrophobic themselves with this long attachment and contact then must be established with small molecular and highly hydrophillic emulsifying agents, in order to carry the molecule complex into solution. By following this, and a similar scheme, a lanolin and lecithin stock solution can be formulated.

Coconut oil soaps, containing sufficient lanolin and lecithin, are distinctly buffered in their highly penetrating action and do not emulsify away the natural oil found on the hair and skin. A reversion takes place, the lanolin making contact with the oil loses its solubility in water, with this additional attachment. The skin is enriched with lanolin and is protected against the irritating effects of cold weather and water.

Cholesterol can be solubilized by emulsifying agents containing the rosin acid benzol ring structure in combination with small molecular weight alkyl aryl sulfonates and by heating. Sulfated and sulfonated cholesterol and a similarly treated lanolin of course can replace the first emulsifying agent. Aromatic and fatty substances with high melting points have to be heated above their melting point and subsequently diluted with sufficient molecules of an emulsifying agent. Being highly compatible and having a high magnetic field of adhesion, such a step is needed to keep their molecules separated. Otherwise they would adhere to each other and develop a turbidity, at room temperature as an expression of their crystallization and residual bonds.

The melting point of such substances is reduced by dilution with other substances, having different melting points different from the fixed value, of the original substance. Very much related in principle is the problem of fixation, the art of fixing perfumes and preventing them from too rapid evaporation, and the principle of azeotropic distillation. The inter molecular forces lend different characteristics entirely to such a blend.

The procedure* of processing self polishing waxes resembles closely the process of solubilizing high melting fatty and aromatic substances. In both cases, elevated temperatures are employed to remove, as far as possible, residual bonds of the crystallized material, and then to disperse the solution of an emulsifying agent. Its hydrophobic end should be closely related in structure and length to the substance to be emulsified. Particle size, transparency of the solution and high gloss of the wax film depend entirely upon the structural coupling of the ingredients.

TABLE IV

Solubility of 5 cc aromatic substances with 15% solubilizing base (consisting of two parts monoethanolamine laurate, two parts 80% K-tallate soap, one part isopropanol) in 10 cc water, additional water or 15% K-coconut oil soap.

Blend of 15 cc base and 5 cc of aromatic substance	*Dissolves in*		*10 cc water followed by excess of 15% K-coconut oil soap*
	10 cc water	*Additional water*	
anisic aldehyde	clear	not clear	clear
bromstyrol	clear	not clear	clear
octyl alcohol	clear	not clear	clear

* Reuben Sperling Manchester Oil refinery Ltd., Manchester, England. Ind. Eng'g. Chemistry 40, 890-7 (1948).

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Every effort is made to keep this index free of errors, but no responsibility is assumed for any omissions.

"Maybe it did cost a lot of dough, — but it sure makes me feel important!"

Ego... or sales?

SHOULD industrial advertising be aimed to satisfy the ego of the advertiser or his agency, — or should it be aimed specifically at the markets where the advertiser's goods are sold or can be sold? Sounds like a silly question, but actually it's very apt in the light of a lot of misdirected industrial advertising today. Why advertise industrial products in the big-name general mags where only a minute fraction of the costly circulations can be even remotely effective? Only advertising double-talk can answer that one.

But, the problem is really simple. Advertise to those you do sell, can sell, and want to sell. If, for example, you want to sell the field of soap and detergent products, cleansers, floor waxes, disinfectants, insecticides, polishes, and allied chemical specialties and janitor supplies, use the magazine which blankets this market at low cost and without waste. It happens to be

SOAP *and Sanitary Chemicals*

254 WEST 31st STREET NEW YORK

Tale Ends

GIVE us Americans half a chance and we can get more hysterical in a shorter time than any nation on earth. Witness the wild scare buying and hoarding of soap, sugar, shoes, and what-not over the past month. Patriotism about which we are so prone to brag? What a laugh this is when the wild buying scramble is on. To hell with inflation! To hell with everybody so long as "I get mine."

• • •

Hanging on the front door of a grocery store on the west side of New York last month we noted a sign, "No soap—no sugar." And the patriotic retailers are not above cashing in on this wave of hysterical hoarding. Some retail prices for soap and sugar are *more than double* their previous levels. And to add insult to injury, this gouging is being reserved strictly for "regular customers."

• • •

Eiffel G. Plasterer of Huntington, Indiana,—no relation to Eiffel Tower of Paris,—blows soap bubbles which last six months. He holds the world's soap bubble record, 180 days, set in 1938, to displace the 108 day previous record of a British scientist. He is a former physics instructor who got into this bubble business via a study of the soap molecule. To avoid commercialization of the science of bubble blowing, he steadfastly refuses to reveal the secret of his success.

• • •

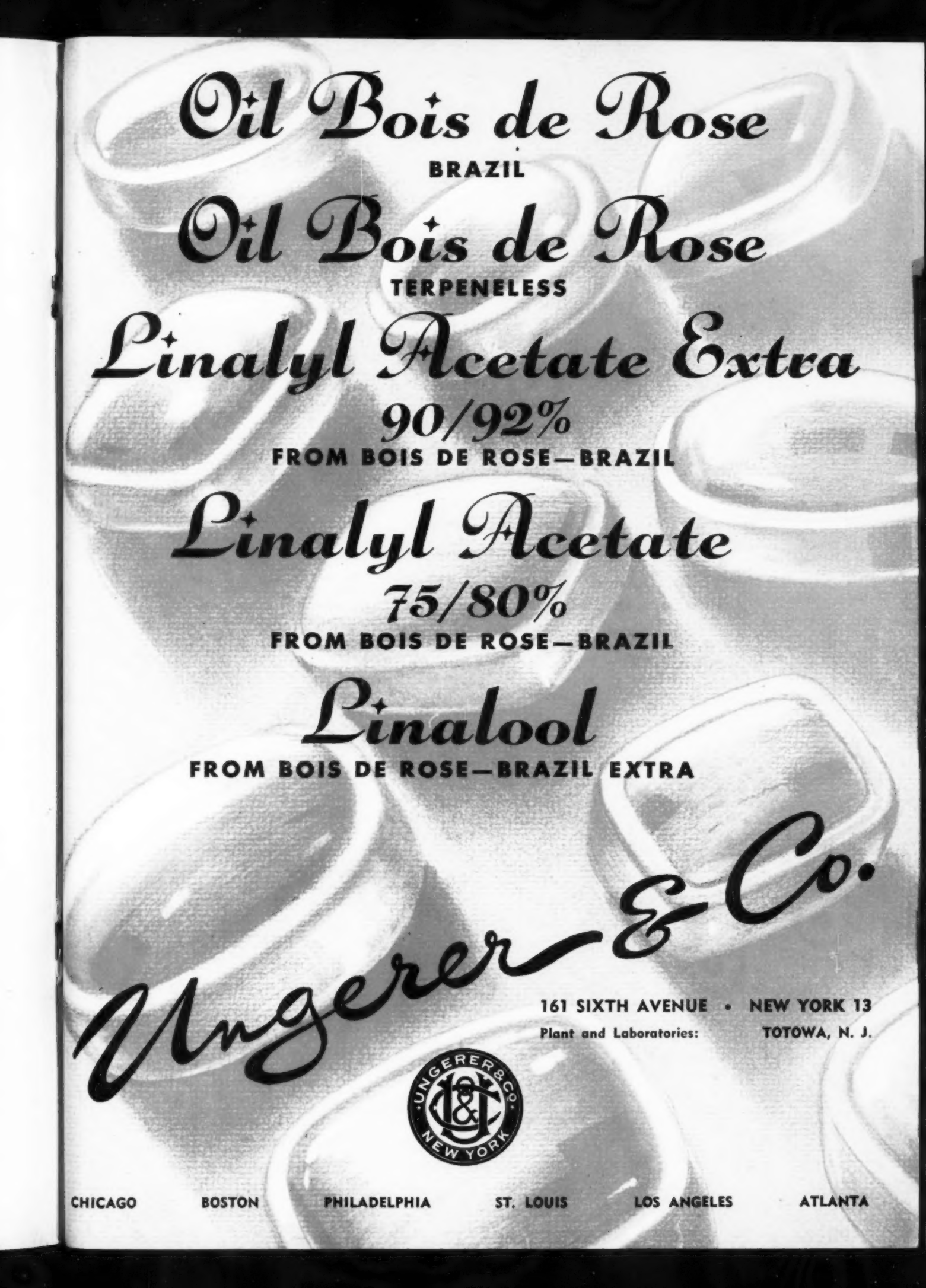
Harold Berliner of Hockwald Chemical, out California way, is a track man of wide repute,—and we don't mean race track where you lose your dough on the nags. We mean track like in track team when you were back at old Siwash, where men do the running. Anyway, Harold has been leading a group of American track athletes for the AAU on a trip through Sweden this summer with, we are told, considerable competitive success.

• • •

Bankers Investment Trust of New York is reported to have bought a big slug of hotel-size toilet soap with its name neatly imprinted on each wrapper. This soap has been shipped to England where it is being used in lieu of calling cards by BIT security salesmen. But, suppose some touchy bond buyer takes this as a suggestion that his neck needs washing?

• • •

Ed Huisking, who runs Conti Products in Brooklyn for his pappy, Charley Huisking, is now the proud owner of the president's championship golf cup of the National Beauty & Barbers Mfrs. Assn. Recently, he won it for the third time in the last four years and that means he can take it home and stand it on the dining room mantlepiece permanently. The cup was originally presented by Edward Breck, former president of the Assn. Ed is chairman of the golf committee for the annual soiree of the N. Y. Drug & Chemical Section next month at Shawnee.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